

# Short CV of Margaret Beck

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## Education

- Ph.D., Mathematics, Boston University, May 2006
- B.A., Mathematics, Colorado College, May 2000

## Employment

- Lecturer, Department of Mathematics, Heriot-Watt University, Edinburgh, Scotland, UK  
September 2011 - Present
- Assistant Professor, Department of Mathematics and Statistics, Boston University, Boston, MA, USA  
Tenure track; September 2009 - Present
- Postdoctoral Fellow, Division of Applied Mathematics, Brown University, Providence, RI, USA  
As part of an NSF Postdoctoral Fellowship, August 2008 - July 2009
- Postdoctoral Fellow, Mathematical Sciences Research Institute, Berkeley, CA, USA  
During the semester-long program Dynamical Systems, January - May 2007
- Research Fellow, Department of Mathematics, University of Surrey, Guildford, UK  
As part of an NSF Postdoctoral Fellowship, September - December 2006 and June 2007 - August 2008

## Grants, Fellowships, and Awards

- 2012 Sloan Research Fellow
- 2011 US National Academy of Sciences Kavli Fellow
- NSF Division of Mathematical Sciences “Standard Grant,” DMS-1007450, July 2010 - June 2013
- NSF Mathematical Sciences Postdoctoral Research Fellowship, DMS-0602891, September 2006 - July 2009
- Red Sock Poster Award, SIAM Conference on Applications of Dynamical Systems, May 2005
- GAANN Fellowship, Department of Mathematics, Boston University, September 2004 - May 2006 and January - December 2001

## Preprints and Publications

- “Metastability and rapid convergence to quasi-stationary bar states for the 2D Navier-Stokes Equations,” with C. E. Wayne. To appear in Proc. Roy. Soc. Edinburgh Sec. A.
- “Toward nonlinear stability of sources via a modified Burgers equation,” with T. Nguyen , B. Sandstede and K. Zumbrun. *Phys. D* 241, 382-392 (2012).
- “Using global invariant manifolds to understand metastability in Burgers equation with small viscosity,” with C. E. Wayne. *SIAM Rev.* 53, no. 1, 129-153 (2011).
- “Stability of traveling wave solutions for coupled surface and grain boundary motion,” with Z. Pan and B. Wetton. *Phys. D* 239, 1730-1740 (2010).
- “Nonlinear stability of time-periodic viscous shocks,” with B. Sandstede and K. Zumbrun. *Arch. Ration. Mech. Anal.* 196, 1011-1076 (2010).
- “Nonlinear stability of semi-discrete shocks for two sided schemes,” with H. J. Hupkes, B. Sandstede, and K. Zumbrun. *SIAM J. Math. Anal.* 42, no. 2, 857-903 (2010).

- “Using global invariant manifolds to understand metastability in Burgers equation with small viscosity,” with C. E. Wayne. *SIAM J. Appl. Dyn. Syst.* 8, no. 3, 1043-1065 (2009).
- “Snakes, ladders, and isolas of localised patterns,” with J. Knobloch, D. Lloyd, B. Sandstede and T. Wagenknecht. *SIAM J. Math. Anal.* 41, 936-972 (2009).
- “Nonlinear convective stability of traveling fronts near Turing and Hopf instabilities,” with A. Ghazaryan and B. Sandstede. *J. Differential Equations* 246, 4371-4390 (2009).
- “Electrical waves in a one-dimensional model of cardiac tissue,” with C.K.R.T. Jones, D. Schaeffer and M. Wechselberger. *SIAM J. Appl. Dyn. Syst.* 7, no. 4, 1558-1581 (2008).
- “Invariant manifolds and the stability of traveling waves in scalar viscous conservation laws,” with C. E. Wayne. *J. Differential Equations*, 244, 87-116 (2008).
- “A geometric construction of traveling waves in a bioremediation model,” with A. Doelman and T. J. Kaper. *J. Nonlinear Sci.*, 16, no. 4, 329-349 (2006).
- “A geometric theory of chaotic phase synchronization,” with K. Josić. *Chaos*, 13(1), 247-258 (2003).

### Selected Recent Presentations and Conference Participation

- Invited minicourse lecturer
  - Gave four lectures on linear stability theory for workshop “The stability of coherent structures and patterns” preceding SIAM conference Nonlinear Waves and Coherent Structures in Seattle, June 2012.
- Invited panelist
  - “Past and Future Directions in Applied Dynamical Systems,” at the conference “Geometric Methods for Infinite-Dimensional Dynamical Systems,” Brown University, November 2011.
  - “Women and Mathematics,” at SIAM conference Dynamical Systems and PDE, Barcelona, May 2010.
- Conference and Workshop Organization
  - SIAM Nonlinear Waves and Coherent Structures: on organizing committee; held at the University of Washington, June 13-16, 2012.
  - “Dynamics in infinite-dimensions: ergodic theory and PDEs,” at the ICMS, Edinburgh, 21-25 May 2012.
- Minisymposium co-organizer
  - Equadiff 2011, Loughborough University, August 1-5, 2011
  - SIAM Applications of Dynamical Systems, Snowbird, UT, USA, May 2011
  - SIAM Emerging Topics in Dynamical Systems and PDE, Barcelona, Spain, May 2010
  - SIAM Nonlinear Waves and Coherent Structures, Università di Roma, July 2008
  - Equadiff 2007, Vienna University of Technology, August 2007
  - SIAM Applications of Dynamical Systems, Snowbird, UT, USA May 2007
- Invited speaker
  - Mathematisches Forschungsinstitut Oberwolfach workshop “Dynamics of Patterns,” 16-22 Dec 2012.
  - IMA workshop on “Dynamical Systems in Studies of Partial Differential Equations,” September 24, 2012.
  - University of Cambridge, Geometric Analysis and Partial Differential Equations seminar, May 2012.
  - University of Bath, Applied Mathematics Seminar, April 2012.
  - Pontificia Universidad Católica and Universidad de Chile, Dynamical Systems seminar, March 2012.
  - University of Warwick, Applied Mathematics Seminar, Feb 2012.
  - University of Strathclyde, Mathematics Colloquium, November 2011.
  - Workshop “Localized Multi-Dimensional Patterns in Dissipative Systems,” BIRS, Canada, July 2011.
  - Coherent structures in evolutionary equations, Lorentz Center, Leiden, NL, July 2010
  - Joint Kungliga Tekniska Högskolan (KTH) and Stockholms Universitet (SU) Colloquium, March 2010

## Professional Service

- Vice Chair, SIAM Activity Group on Nonlinear Waves and Coherent Structures, Jan 1, 2013 - Dec 31, 2014.
- Member of NSF grant review panel, 2011 and 2013.
- Article Referee  
For journals including Memoirs of the AMS, Archive for Rational Mechanics and Analysis, SIAM Journal of Mathematical Analysis, SIAM Journal on Applied Mathematics, SIAM Journal of Applied Dynamical Systems, Physica D, Nonlinearity, Discrete and Continuous Dynamical Systems B, and SIAM Undergraduate Research Online.
- Administrative activities withing the Heriot-Watt University Department of Mathematics
  - CANPDE Crash Courses co-organizer: mini-course for PhD students
- Administrative activities within the Boston University Department of Mathematics and Statistics
  - RULE committee: involved in restructuring of departmental introductory calculus classes (2010)
  - Graduate committee: evaluated applications and wrote/graded qualifying exams (2009-10)
  - Website Committee: involved in redesign of departmental webpage (2009-present)
  - Member of PhD committee: second reader of thesis for graduating PhD student (2010)
- Seminar co-organizer
  - Boston University Dynamics Seminar, September 2009 - August 2011
  - Joint Brown and Boston University PDE Seminar, September 2009 - August 2011
  - Boston University Graduate Student Dynamics Seminar, January 2004 - December 2005
- Author of article for DS Web Magazine
- Member of the Edinburgh Mathematical Society (EMS), the American Mathematical Society (AMS), and the Society for Industrial and Applied Mathematics (SIAM).

## Academic Visits

- Long-term visitor, Institute for Mathematics and its Applications, Minneapolis, USA, Fall 2012  
During the program “Infinite dimensional and stochastic dynamical systems and their applications.
- Visitor, Institut Mittag-Leffler, Sweden, March 1-14 and May 22-30, 2010  
Invited participant in the semester-long program on Dynamics and PDEs; gave two talks in the program seminar.
- Host for Visitor, Boston University, Spring 2010  
Organized visit of Bob Rink, from Vrije Universiteit Amsterdam, who spent sabbatical at Boston University.
- Visitor, Oxford Centre for Nonlinear PDE, October 13-25, 2008  
Academic visit hosted by John Ball; gave two talks in the Lunchtime Seminar Series.

## Recent Teaching Experience

- Undergraduate thesis supervisor for 3 undergraduates at Heriot-Watt University, Spring 2012 .
- Reading group co-organizer  
Co-organized weekly seminar for graduate students, postdocs, and faculty:
  - Boston University, Boston, MA, Fall 2009; Topic: the Evans Function.
  - University of Surrey, Guildford, UK, Fall 2007; Topic: PDEs and Energy Estimates.
- Course Instructor
  - Topology (4th year undergraduate course), Heriot-Watt University, UK, Autumn 2011
  - Multivariate Calculus (undergraduate course), Boston University, USA, Spring 2011
  - Ordinary Differential Equations (graduate course), Boston University, USA, Fall 2010
  - Discrete Dynamical Systems (graduate course), Boston University, USA, Spring 2010
  - Linear Algebra (undergraduate course), Boston University, USA, Fall 2009
  - Linear PDE (2nd year undergraudate course), University of Surrey, UK, Spring 2008