

# Curriculum Vitae

Dr. Barbara Zubik-Kowal

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 Boise State University                    **web:** <http://math.boisestate.edu/~zubik/>  
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**Position:** Associate Professor of Mathematics

## University Diplomas:

Ph.D., Adam Mickiewicz University, Faculty of Mathematics and Computer Science, 1996.

Dissertation: *Functional Differential Inequalities and Applications*.

M.Sc., University of Gdańsk, Institute of Mathematics, 1990. Thesis: *Numerical Methods for Spline Functions Approximation*.

## Post-doctoral Fellowship Positions:

- Belgium, Feb. 1997 - Jul. 1998  
Katholieke Universiteit Leuven, Department of Computer Sciences
- The Netherlands, Sep. 1998 - Aug. 1999  
Leiden University, Department of Mathematics
- United Kingdom, Oct. 1999 - Sep. 2000  
University of Strathclyde, Department of Mathematics

## Assistant and Associate Professor Positions:

- Assistant Professor, May 1996 - Feb. 1997 & Sept. 2000 - May 2001, University of Gdańsk, Department of Mathematics
- Visiting Assistant Professor, Aug. 2001 - May 2002, Arizona State University, Department of Mathematics
- Assistant Professor, Aug. 2002 - 2006, Boise State University, Department of Mathematics
- Associate Professor Aug. 2006 - present, Boise State University, Department of Mathematics

## Editorial Board:

Scholarpedia: Numerical Analysis Category, peer-reviewed journal

## Teaching experience outside the USA:

- Poland, Department of Mathematics, University of Gdańsk  
 Oct. 1990 - Jan. 1997, Oct. 2000 - Aug. 2001
  - Numerical Analysis, regular academic classes
  - Differential Equations, regular academic classes
  - Computer Science, regular academic classes
  - Calculus, regular academic classes
- The Netherlands, Department of Mathematics, Leiden University, Oct. 1998-Jan. 1999
  - Numerical Stability Theory, supervisions

### Teaching experience in the USA, since August 2001:

Semester	Academic Classes	Units per week	Class Components
<b>Spring09</b>	Math 537	3 × 50min	Lecture - Required
	Math 496	1 × 75min	Independent Study
	Math 170, Section 003	4 × 50min	Lecture - Required
	Math 170, Section 004	4 × 50min	Lecture - Required
<b>Fall08</b>	Math 436/536	3 × 50min	Lecture - Required
	Math 170, Section 004	4 × 50min	Lecture - Required
	Math 170, Section 005	4 × 50min	Lecture - Required
<b>Spring08</b>	Math 567	3 × 50min	Lecture - Required
	Math 175	4 × 50min	Lecture - Required
<b>Fall07</b>	Math 333	4 × 50min	Lecture - Required
	Math 175	4 × 50min	Lecture - Required
<b>Spring07</b>	Math 170	4 × 50min	Lecture - Required
	FRAP Research Grant	4 × 50min	funds to support research
<b>Fall06</b>	Math 175	4 × 50min	Lecture - Required
	Math 171	1 × 50min	Lecture - Required
	FRAP Research Grant	3 × 50min	funds to support research
<b>Spring06</b>	Math 333	4 × 50min	Lecture - Required
	Math 160	4 × 50min	Lecture - Required
<b>Fall05</b>	Math 301	4 × 50min	Lecture - Required
	Math 175	4 × 50min	Lecture - Required
<b>Spring05</b>	Math 333	4 × 50min	Lecture - Required
	Math 170	4 × 50min	Lecture - Required
<b>Fall04</b>	Math 436	3 × 50 min	Lecture - Required
	Math 170	4 × 50 min	Lecture - Required
<b>Spring04</b>	Math 175	4 × 50 min	Lecture - Required
	Math 170	4 × 50 min	Lecture - Required
<b>Fall03</b>	Math 333	4 × 50 min	Lecture - Required
	Math 170	4 × 50 min	Lecture - Required
<b>Spring03</b>	Math 170	4 × 50 min	Lecture - Required
	Math 170	4 × 50 min	Lecture - Required
<b>Fall02</b>	Math 175	4 × 50 min	Lecture - Required
	Math 175	4 × 50 min	Lecture - Required
<b>Spring02</b>	MAT 342	3 × 50 min	Arizona State University
	MAT 342	3 × 50 min	Arizona State University
<b>Spring01</b>	MAT 342	3 × 50 min	Arizona State University
	MAT 342	3 × 50 min	Arizona State University

- USA, Boise State University, Department of Mathematics, Aug. 2002 - present
  - Numerical Methods for Ordinary Differential Equations MATH 567
  - Applied Mathematics MATH 537
  - Partial Differential Equations MATH 536/436
  - Independent Study MATH 496
  - Differential Equations with Matrix Theory MATH 333
  - Linear Algebra MATH 301
  - Calculus MATH 170, 171, 175
  - Survey of Calculus MATH 160
- USA, Arizona State University, Department of Mathematics, Visiting Assistant Professor, Aug. 2001 - May 2002
  - Linear Algebra, MAT 342

## Papers in peer-reviewed journals & 2 proceedings, part I of the list:

- [34] Jackiewicz Z.; Jorcyk, C.L.; Kolev, M.; Zubik-Kowal, B., Correlation between animal and mathematical models for prostate cancer progression, *Comput. Math. Methods Med.*, 10 (2009), no. 3, in press.
- [33] Basse, B.; Jackiewicz Z.; Zubik-Kowal, B., Finite-difference and pseudospectral methods for the numerical simulations of *in vitro* human tumor cell population kinetics, *Math. Biosci. Eng.* 6 (2009) no.3, 561-572.
- [32] Jackiewicz, Z.; Kuang, Y.; Thalhauser, C.; Zubik-Kowal, B., Numerical solution of a model for brain cancer progression after therapy, *Math. Model. Anal.*, 14 (2009) no. 1, 43-56.
- [31] Jackiewicz Z.; Zubik-Kowal, B., Discrete variable methods for delay-differential equations with threshold type delays, *J. Comp. Appl. Math.*, 228 (2009) 514-523.
- [30] Zubik-Kowal, B., Delay partial differential equations, *Scholarpedia*, peer-reviewed open-access encyclopedia, (2008) 3(4):2851.
- [29] Hoppensteadt, F. C.; Jackiewicz, Z.; Zubik-Kowal, B., Numerical solution of Volterra integro-differential equations modeling thalamo-cortical systems, *PAMM Wiley Interscience Journal, Proc. Appl. Math. Mech.* 7, Published Sep. 18 2008.
- [28] Crook, S.; Dur-e-ahmad, M.; Jackiewicz, Z.; Zubik-Kowal, B., A variant of pseudospectral method for activity-dependent dendritic branch model, *J. of Neuroscience Methods*, 165, (2007) no. 2, 306–319.
- [27] Hoppensteadt, F. C.; Jackiewicz, Z.; Zubik-Kowal, B., Numerical Solution of Volterra Integral and Integro-Differential Equations with Rapidly Vanishing Convolution Kernels, *BIT Numerical Mathematics*, 47 (2007), no. 2, 325–350.
- [26] Jackiewicz, Z.; Zubik-Kowal, B., Numerical solutions of thalamo-cortical systems, *Numerical Analysis and Approximation Theory*, (2006) 239–246.
- [25] Zubik-Kowal, B., Solutions for the cell cycle in cell lines derived from human tumors, *Comput. Math. Methods Med.*, 7(4) (2006), 215-228.
- [24] Jackiewicz, Z.; Zubik-Kowal, B., Spectral collocation and waveform relaxation methods for nonlinear delay partial differential equations, *Appl. Numer. Math.*, 56 (2006), 433–443.
- [23] Jackiewicz, Z.; Zubik-Kowal, B., Spectral collocation and waveform relaxation methods with Gengenbauer reconstruction for nonlinear conservation laws, *Comput. Methods Appl. Math.*, 5(1) (2005), 51-71.
- [22] Mead, J.; Zubik-Kowal, B., An iterated pseudospectral method for delay partial differential equations, *Appl. Numer. Math.*, 55 (2005), 227-250.
- [21] Davies, P. J.; Duncan, D. B.; Zubik-Kowal, B., The stability of numerical approximations of the time domain current induced on a thin wire and strip antennas, *Appl. Numer. Math.*, 55 (2005), 48-68.
- [20] in 't Hout, K. J.; Zubik-Kowal, B., On the stability of Radau IIA collocation methods for delay differential equations, *Math. Comput. Modelling*, 40 (2004), 1297-1308.
- [19] Mead, J.; Zubik-Kowal, B., Pseudospectral iterated method for differential equations with delay terms, *Springer-Verlag, Lecture Notes in Computer Science*, LNCS 3039 (2004),

## Papers in peer-reviewed journals - part II of the list:

451-458.

- [18] Zubik-Kowal, B., Error bounds for spatial discretization and waveform relaxation applied to para-bolic functional-differential equations, *J. Math. Anal. Appl.* **293** (2004), 496-510.
- [17] Davies, P. J.; Zubik-Kowal, B., Fourier stability analysis of a numerical method for time domain electromagnetic scattering from a thin wire, *Numer. Algorithms* **35** (2004), 121-130.
- [16] Jackiewicz, Z.; Welfert, B. D.; Zubik-Kowal, B., Spectral versus pseudospectral solutions of the wave equation by waveform relaxation methods, *J. Sci. Comput.* **20** (2004), 1-28.
- [15] Zubik-Kowal, B., Error estimations for iterated numerical schemes applied to parabolic partial differential equations, *Int. J. Appl. Math.* **14** (2003), 259-268.
- [14] Davies, P. J.; Rynne, B. P.; Zubik-Kowal, B., The time domain integral equation for a straight thin wire antenna with the reduced kernel is not well-posed, *IEEE Trans. Ant. Prop.*, **50**(8), (2002), 1165–1166.
- [13] Davies, P. J.; Zubik-Kowal, B., Numerical approximation of time-domain electromagnetic scattering, *Numer. Algorithms*, **30** (2002), 25-36.
- [12] Zubik-Kowal, B., Stability in the numerical solution of linear parabolic equations with a delay term, *BIT Numerical Mathematics* **41**:1 (2001), 191-206.
- [11] Zubik-Kowal, B., Chebyshev pseudospectral method and waveform relaxation for differential and differential-functional parabolic equations, *Appl. Numer. Math.*, **34**(2-3), (2000), 309-328.
- [10] Vandewalle, S.; Zubik-Kowal, B., Waveform relaxation for functional-differential equations, *SIAM J. Sci. Comput.*, **21**(1), (1999), 207-226.
- [9] Zubik-Kowal, B., The method of lines for parabolic differential-functional equations, *IMA Jour. Num. Anal.*, **17** (1997), 103-123.
- [8] Kamont, Z.; Zubik-Kowal, B., Numerical methods for impulsive partial differential equations, *Dynamic Syst. and Appl.*, **7**(1), (1998), 29 - 52.
- [7] Zubik-Kowal, B., The method of lines for impulsive functional partial differential equations of the first order, *Comm. Appl. Anal.*, **2** (1998), 111-128.
- [6] Kamont, Z.; Turo, J.; Zubik-Kowal, B., Differential and difference inequalities generated by mixed problem for hyperbolic functional differential equations with impulses, *Appl. Math. Comp.*, **80** (1996), 127-154.
- [5] Zubik-Kowal, B., Convergence of the method of lines for parabolic differential-functional equations, *Advances in Difference Equations*, August 7-11, 1995.
- [4] Zubik-Kowal, B., The method of lines for first order partial differential-functional equations, *Stud. Scien. Math. Hung.*, **34** (1998), 413-428.
- [3] Zubik-Kowal, B., Monotone iterative method for Caratheodory solutions of differential-functional equations, *Le Matematiche*, **L**, II (1995), 311-321.
- [2] Zubik-Kowal, B., Convergence of the lines method for first-order partial differential-functional equations, *Numer. Meth. Part. Diff. Eqs*, **10** (1994), 395-409.
- [1] Zubik-Kowal, B., On first order partial differential-functional inequalities, *Math. Balk.*, **6** (1992), 75-82.

### **Invitations to organize minisymposia at International Conferences:**

- Japan, Nagoya, 2005, SciCADE

I organized the Minisymposium on “Numerical Methods for Problems with Functional Dependence” at the International Conference on Scientific Computation and Differential Equations, SciCADE05.

### **Invited Plenary Talks at International Conferences:**

- USA, Arizona State University, May 2004.

Plenary talk at The 3rd International Conference on The Numerical Solution of Volterra and Delay Equations: “Pseudospectral and waveform relaxation methods for delay PDEs”.

- Poland, University of Gdansk, June 2005.

Plenary talk at The International Conference on Differential-Functional Equations: “Influence of coefficients occurring in systems of delay differential equations on the convergence of waveform relaxation”.

### **Invited Minisymposium Talks at International Conferences:**

- China, Beijing, May, 2009.

Invited talk at SciCADE09 International Conference:

“Numerical solutions of nonlinear Volterra integro-differential equations describing brain dynamics”.

- Norway, Trondheim, July, 2003.

Invited talk at SciCADE03 International Conference:

“Numerical solutions for electric field integral equations”.

- Canada, Vancouver, British Columbia, Aug. 2001.

Invited talk at SciCADE01 International Conference:

“On the stability of Radau IIA collocation methods for delay differential equations”.

### **Invited talk at International Workshops:**

- Poland, Warsaw, June 2009, International Workshop on Mathematical and Computational Approaches in Biology and Medicine

### **Talks at International Conferences (listed only since 1996):**

- China, Beijing, May 2009, International Conference on Scientific Computation and Differential Equations, SciCADE09.
- Belgium, Gent, July 2008, 13th International Congress on Computational and Applied Mathematics, ICCAM08.
- Switzerland, Zurich, July 2007, 6th International Congress on Industrial and Applied Mathematics, ICIAM07.
- Romania, Cluj-Napoka, July 2006, International Conference on Numerical Analysis

and Approximation Theory, NAAT06.

- Poland, Gdansk, June 2005, International Conference on Differential-Functional Equations, DFE05.
- Japan, Nagoya, May 2005, International Conference on Scientific Computation and Differential Equations, SciCADE05.
- Poland, Krakow, June 2004, International Conference on Computational Science, ICCS04.
- USA, Arizona State University, Tempe, May 2004, 3rd International Conference on The Numerical Solution of Volterra and Delay Equations.
- Norway, Trondheim, June 2003, International Conference on Scientific Computation and Differential Equations, SciCADE03.
- Canada, Vancouver, British Columbia, August 2001, International Conference on Scientific Computation and Differential Equations, SciCADE01.
- United Kingdom, Bath, September 2000, 2nd International Conference on Boundary Integral Methods.
- Australia, Queensland, Fraser Island, August 1999, International Conference on Scientific Computation and Differential Equations, SciCADE99.
- The Netherlands, Utrecht, April 1999, Het 34e Nederlands Mathematisch Congres.
- New Zealand, Auckland, July 1998, Auckland Numerical Ordinary Differential Equations ANODE98.
- Italy, Grado, September 1997, International Conference on Scientific Computation and Differential Equations, SciCADE97.
- United Kingdom, Dundee, June 1997, 17th Biennial Conference on Numerical Analysis.
- USA, Arizona State University, Tempe, May 1996, 2nd International Conference on The Numerical Solution of Volterra and Delay Equations.

### **Invited Colloquium Talks:**

- Poland, University of Warmia and Mazury, June 2007,  
“Konstrukcja metod iteracyjnych dla modelu opisującego rozwój komórek rakowych”.
- USA, Arizona State University, March 2005,  
“Using magnitudes of entries of differential systems in the analysis of convergence of waveform relaxation applied to the systems”.
- Poland, Gdansk University, June 2003,  
“Numerical solutions for electric field integral equations”.
- Poland, Technical University of Gdansk, June 2003,  
“Numerical solutions for electric field integral equations”.
- United Kingdom, University of Cambridge, May 2000,  
“Waveform relaxation for differential-functional equations”.

### Other (but not all) Colloquium Talks:

- USA, Boise State University, October 2008.
- USA, Boise State University, January 2005.
- USA, Arizona State University, November 2001.
- Poland, University of Gdansk, December 2000.
- United Kingdom, University of Reading, April 2000.
- United Kingdom, Strathclyde University, October 1999.
- The Netherlands, University of Leiden, May and November 1998.
- United Kingdom, Heriot-Watt University, February 1998.
- Belgium, Katholieke Universiteit Leuven, March 1997.

### Graduate, Undergraduate, Math and Engineering Seminars:

- 2009 - Spring: Research talk for the Department of Mechanical and Biomedical Engineering, College of Engineering  
Title: *Parallel algorithms for functional differential equations*
- 2008 - Fall: Research talk for the Graduate Math Seminars  
Title: *Ordinary and partial functional differential equations*
- 2007 - Spring: Research talk for the Undergraduate Seminar  
Title: *Numerical methods for the growth of human tumor cells*
- 2006 - Fall: Research talk for the Graduate Math Seminars  
Title: *Error bounds derived for thalamo-cortical systems*
- 2005 - Spring: Research talk at the Math Seminar  
Title: *Numerical solutions to differential equations*
- 2004 - Spring: Research talk at the Math Seminar  
Title: *Iteration methods for partial differential equations*

### Research Grants:

- **WBT** Grant, Warsaw BioMat Team, (2009)
- **NSF AWM** Grant, (2008-2009).
- **COAS** Travel Grant, (2008).
- **FRAP** Faculty Research Associates Program (2006-2007).
- **COAS** Travel Grant, (2006).
- **COAS** Travel Grant, (2004).
- **NSF AWM** Grant, (2003-2004).
- **COAS** Travel Grant, (2002).

- **BW** Badania Wlasne - Polish Science Foundation, (2000-2001).
- **EPSRC** Grant - Engineering and Physical Sciences Research Council, (1999-2000).
- **NWO** Nederlandse organisatie voor wetenschappelijk onderzoek - Dutch Science Foundation, (1998-1999).
- **FWO** Vlaanderen - Belgian Funds for Scientific Research, (Feb.1997-July 1998).

### **Service - International**

#### **Chair for Sessions at International Conferences**

#### **Work as a Reviewer for International Journals:**

- *SIAM Review, Education section* • *SIAM J. Scientific Computing* • *IMA Journal of Numerical Analysis* • *Mathematics and Computers in Simulation* • *Nonlinear Analysis Series B: Real World Applications* • *IMACS Journal of Applied Numerical Mathematics* • *American Institute of Physics (AIP) Conference Series, Numerical Analysis & Applied Math* • *Advances in Computational Mathematics* • *Mathematical and Computer Modelling* • *Soochow Journal of Mathematics* • *Annales Polonici Mathematici* • *Mathematical Modelling and Analysis* • *Computing* • *Journal of Computational and Applied Mathematics*

### **Service - National**

- Reviewer for the NSF: Division of Mathematical Sciences
- Reviewer for Mathematical Reviews, American Mathematical Society
- Consultation for Editorial Board, *W.H. Freeman Publishers*

### **Service - University**

- Contribution in the application for the BSU Beowulf cluster
- Recognition of Outstanding Faculty Service

### **Service - College**

- Service on the College of Arts and Sciences Honors and Awards Committee
- Math Department's Chair Selection Committee
- Science Competition Day Exam, Mathematics Section
- Academic advising

### **Service - Departmental**

- Colloquium Committee, Chair, since Fall 2008

- Calculus Committee, Chair, since Fall 2007
- Colloquium Committee, Member, since Fall 2007
- Applied Mathematics Committee, Member, since Fall 2002
- Calculus Committee, Member, since Fall 2002
- Applied Courses Subcommittee, Member, since Fall 2007
- Grading in Problemathon