

A. Professional Preparation:

John M. Neuberger

- (a) BS. Mathematics, Univ. of North Texas, 1984.
- (b) MS. Mathematics, Colorado State Univ., 1986.
- (c) Ph.D. Mathematics, Univ. of North Texas, 1995.

B. Appointments:

- (a) NAU, Assist. Prof., Fall 1997 to Fall 2002, Assoc. Prof to date.
- (b) MSU, Assist. Prof., Fall 1995 to 1997.
- (c) E-Systems, Garland Division, Software Eng., 1986-1990.

C. **R**elated and **C**losely related publications:

- R1 “Newton’s method and Morse index for semilinear elliptic PDE, with James W. Swift, *Int. J. Bif. Chaos* 11 (2000), No. 3 801-820.
- R2 “Numerical solutions of a vector Ginzburg-Landau equation with a triple-well potential”, with James W. Swift and D. Rice, *Internat. J. Bifur. Chaos Appl. Sci. Engrg.* 13 (2003), no. 11, 3295-3306.
- R3 “GNGA: Recent Progress and Open Problems for Semilinear Elliptic PDE”, *AMS J. Contemp. Math.* 357, (2004), 201-238.
- R4 “Symmetry and Automated Branch Following for a Semilinear Elliptic PDE on a Fractal Region”, with Nandor Sieben and James W. Swift, to appear in *SIAM J. Dynamical Systems*, 2006.
- R5 “Nonlinear Partial Difference Equations on Graphs”, *J. Experimental Math.* 15 (2006), no. 1, 91-107.
- C1 “A sign-changing solution for a superlinear Dirichlet problem”, with A. Castro and J. Cossio, *Rocky Mountain J. Math.* 27 (1997), no. 4, 1041–1053.
- C2 “A sign-changing solution for a superlinear Dirichlet problem. II”, with A. Castro and P. Drabek, *Proceedings of the Fifth Mississippi State Conference on DE & CS* (Mississippi State, MS, 2001), 101–107 (electronic), *EJDE Conf.*, 10, Southwest Texas State Univ., San Marcos, TX, 2003.
- C3 “A Numerical Investigation of Sign-Changing Solutions to Superlinear Elliptic Equations on Symmetric Domains”, with D. Costa and Z. Ding, *J. Comp. App. Math.* (2001) 131, no. 1, 299–319.
- C4 “GNGA for General Regions: Semilinear Elliptic PDE and Crossing Eigenvalues”, with J. Hineman, to appear in *Communications in Nonlinear Science and Numerical Simulation*, 2006.
- C5 “Computing Eigenfunctions on the Koch Snowflake: A New Grid and Symmetry”, with Nandor Sieben and James W. Swift, *J. Comp. and Appl. Math.* 191 (2006), no. 1, 126 – 142.

D. Synergistic Activities:

Approximately 30 undergraduate and graduate students have engaged in appropriate levels of the PI's research. PI Neuberger has mentored 7 M.S. Thesis, 3 resulting in publications. Other students include many REU mentees, independent studies, and a NASA Space Grant (NAU Physics). Many were active during the period Fall 2000 through Fall 2003, and hence partially supported by NSF grant DMS-0074326. The PI used that grant to stimulate the NAU Department of Math. and Stat. Modeling and Simulation Lab (MSL), mentoring student investigation into parallel processing code, Bifurcation, Neural Networks, and Newton's Method for Elliptic PDE. PI mentored all 6 REU students over projects related to partial difference equations on graphs during Summer 2007. One joint paper currently being submitted and a second one under consideration for submission.

E. Collaborators and Other Affiliations:

Collaborators: Alfonso Castro, PhD Advisor (HMC); Jorge Cossio (Medellin, Colombia); David Costa and Zhonghai Ding (UNLV); Pavel Drabek (Czech. Rep.); Jay Hineman, Sheldon Lee, and Dennis Rice (former M.S. students); Nandor Sieben and James W. Swift (NAU); Jason Lee (REU Summer 2007).

Thesis Advisees: Jeff Crabill (1998, now instructing at Everett Junior College); Michael Butros (1999, now instructing at Victor Valley College); Sheldon Lee (2000, publication, now studying at CSU, Ft. Collins); Dennis Rice (2001, publication, last studying ASU, Phoenix); Jay Hineman (2004, publication, studying abroad); Julie Baca (2004, now instructing at a Texas junior college); Ty Thompson (2005, now studying at CSM, Golden).