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EDUCATION

University of Colorado – Boulder, Colorado
Ph.D. in Applied Mathematics, May 2003
Advisor: Professor Bengt Fornberg
Dissertation: “Radial Basis Function Interpolation: Numerical and Analytical Developments”

University of Colorado – Boulder, Colorado
M.S. in Applied Mathematics, May 2000

Westminster College – Salt Lake City, Utah
B.S. in Mathematics (*Magna Cum Laude*), May 1997

PROFESSIONAL EXPERIENCE

7/11-Present **Associate Professor** – Boise State University
7/07-6/11 **Assistant Professor** – Boise State University
7/06-7/07 **NSF Postdoctoral Fellow** – University of Utah
7/06-8/06 **Visiting Scientist, National Center for Atmospheric Research** – Boulder, CO
7/03-6/06 **NSF VIGRE Assistant Professor (Lecturer)** – University of Utah
9/99–5/03 **NSF VIGRE Graduate Trainee** – University of Colorado, Boulder
8/97 – 12/01 **Software Engineer III** – Ionics Instruments, Boulder, Colorado

RESEARCH INTERESTS

Applied and computational mathematics: radial basis function, pseudospectral, and high resolution finite volume methods for numerically solving partial differential equations; multigrid and Krylov subspace methods for solving linear systems that arise in computational fluid dynamics problems.

Mathematical Geosciences: atmospheric fluid dynamics and solid earth geophysics.

Mathematical Biology: multiphase, complex, viscoelastic biofluids (biogels).

REFEREED PUBLICATIONS¹

JOURNAL ARTICLES (CHRONOLOGICAL ORDER)

1. B. Fornberg, T.A. Driscoll, G.B. Wright, and R. Charles. Observations on the behavior of radial basis functions near boundaries. *Comput. Math. Appl.*, 43 (2002), 473-490.
2. B. Fornberg, G.B. Wright, and E. Larsson. Some observations regarding interpolants in the limit of flat radial basis functions. *Comput. Math. Appl.* 47 (2004), 37-55.
3. B. Fornberg and G.B. Wright. Stable computation of multiquadric interpolants for all values of the shape parameter. *Comput. Math. Appl.* 48 (2004), 853-867.

¹Preprints available for download at <http://math.boisestate.edu/~wright/research/>

4. G.B. Wright and B. Fornberg. Scattered node compact finite difference-type formulas generated from radial basis functions. *J. Comput. Phys.* 212 (2006), 99-123.
5. B. Fornberg, E. Larsson, and G.B. Wright. A new class of oscillatory radial basis functions. *Comput. Math. Appl.* 51 (2006), 1209-1222.
6. O.E. Livne and G.B. Wright. Fast multilevel evaluation of smooth radial basis function expansions. *ETNA.* 23 (2006), 263-287.
7. N. Flyer and G.B. Wright. Transport schemes on a sphere using radial basis functions. *J. Comp. Phys.* 226 (2007), 1059-1084.
8. F.J. Narcowich, J.D. Ward, and G.B. Wright. Divergence-free RBFs on Surfaces. *J. Fourier Anal. Appl.* 13 (2007), 643-663.
9. G.B. Wright, R.D. Guy, and A.L. Fogelson. An efficient and robust method for simulating two-phase gel dynamics. *SIAM J. Sci. Comput.*, 30 (2008), 2535-2565.
10. E.J. Fuselier, F.J. Narcowich, J.D. Ward, and G.B. Wright. Error and stability estimates for surface-divergence free RBF interpolants on the sphere. *Math. Comp.*, 78 (2009), 2157-2186.
11. J. Du, A.L. Fogelson, and G.B. Wright. A parallel computational method for simulating two-phase gel dynamics. *Int. J. Numer. Meth. Fluids*, 60 (2009), 633-649.
12. N. Flyer and G.B. Wright. A radial basis function method for the shallow water equations on a sphere. *Proc. Roy. Soc. A*, 465 (2009), 1949-1976.
 - 8th most cited paper in *Proc. Roy. Soc. A* in 2009
13. E.J. Fuselier and G.B. Wright. Stability and error estimates for vector field interpolation and decomposition on the sphere with RBFs. *SIAM J. Numer. Anal.*, 47 (2009), 3213-3239.
 - One of the top 20 most downloaded papers from *SIAM J. Numer. Anal.* from Oct 2009 – Jan. 2010.
14. J. Schmidt², C. Piret, N. Zhang, B.J. Kadlec, D.A. Yuen, Y. Liu, G.B. Wright, and E.O.D. Sevre. Modeling of tsunami waves and atmospheric swirling flows with graphics processing unit (GPU) and radial basis functions (RBF). *Concurrency Comput.: Pract. Exp.*, 22 (2010), 1813-1835.
15. G.B. Wright, N. Flyer, and D.A. Yuen. A hybrid radial basis function - pseudospectral method for thermal convection in a 3D spherical shell. *Geochem. Geophys. Geosyst.*, 11 (2010), Q07003.
16. R.D. Guy, T. Nakagaki, and G.B. Wright. Flow-induced channel formation in the cytoplasm of motile cells. *Phys. Rev. E*, 84:016310 (2011).
17. G.B. Wright, R.D. Guy, J. Du, and A.L. Fogelson. A high-resolution finite-difference method for simulating two-fluid, viscoelastic gel dynamics. *J. Non-Newton. Fluid Mech.*, 166 (2011), 1137-1157.
18. N. Flyer, E. Lehto, S. Blaise, G.B. Wright, and A. St-Cyr. A guide to RBF-generated finite differences for nonlinear transport: shallow water simulations on a sphere. *J. Comput. Phys.* In press (2012).
19. E.J. Fuselier and G.B. Wright. Scattered data interpolation on embedded submanifolds with restricted positive definite kernels: Sobolev error estimates. *SIAM J. Numer. Anal.* Accepted (2012).

SUBMITTED JOURNAL ARTICLES

1. V. Shankar, G.B. Wright, A.L. Fogelson, and R.M. Kirby. A Study of Different Modeling Choices For Simulating Platelets Within the Immersed Boundary Method. Submitted (2011).

CONFERENCE PROCEEDINGS AND BOOK CHAPTERS

1. G.B. Wright and B. Fornberg. Scattered node mehrstellenverfahren-type formulas generated from radial basis functions. In *Computational Methods*, G. Liu, V. Tan, and X. Han, eds. Springer, Netherlands, 2006, 1391-1395.
2. O.E. Livne and G.B. Wright. Fast multilevel evaluation of 1-D piecewise smooth radial basis function expansions. To appear (2007) *SIAM Proceedings on Geometric Design and Computing*, Phoenix, Arizona 2005.
3. D.A. Sanchez², C. Gonzalez², D.A. Yuen, G.B. Wright, and G. Barnett². High Rayleigh Number Mantle Convection on GPU. To appear in *GPU Solutions to Multi-Scale Problems in Science and Engineering*, D.A. Yuen, J. Wang, L. Johnsson, C. Chi, and Y. Shi, eds. Springer, Netherlands, 2011.

² Undergraduate student

4. U. Harlander, G.B. Wright, and C. Egbers. Reconstruction of the 3D flow field in a differentially heated rotating annulus by synchronized particle image velocimetry and infrared thermography measurements. Submitted to the *16th Int. Symp on Appl. Laser Techniques to Fluid Mechanics*, Lisbon, Portugal, July 09 – 12, 2012.

AWARDS

- **Graduate School Travel Award**, University of Colorado, Boulder (1999).
- **National Science Foundation VIGRE Graduate Traineeship**, University of Colorado (1999-2003)
- **National Science Foundation VIGRE Postdoctoral Fellowship**, University of Utah (2003-2006)
- **National Science Foundation Postdoctoral Fellowship**, University of Utah (2006-2007)
- **National Science Foundation grant (ATM 0801309)**. Collaboration in Mathematical Geosciences: Freedom from Coordinate Systems, and Spectral Accuracy with Local Refinement: Radial Basis Functions for Climate and Space-Weather Prediction. PI. Duration: 9/2006-9/2010. Award to Boise State: \$45,040.
- **National Science Foundation grant (DMS 0540779)**. Formation and Function of Physiological Gels. Co-PI. Duration: 6/2006-6/2010. Total award: \$1,212,067. Award to Boise State University: \$43,990.
- Faculty Development Grant. Office of the Vice President of Research, Boise State University. 1/2009.
- **National Science Foundation grant (DMS-0934581)**. CMG Collaborative Research: Fast and Efficient Radial Basis Function Algorithms for Geophysical Modeling on Arbitrary Geometries. PI. Duration: 9/2009-9/2013. Total award: \$1,000,000. Award to Boise State University: \$200,000.
- **NVIDIA CUDA Research Center Program**. GPU Computing Research at Boise State University. Co-PI. Duration: 1/1/2011-12/31/2011.

SELECTED PRESENTATIONS

TALKS

1. PhD Thesis Defense.
University of Colorado, Boulder, April 3, 2003.
Title: Radial Basis Function Interpolation: Numerical and Analytical Developments.
2. Applied Math Seminar.
University of Utah, September 8, 2003.
Title: An Introduction to the Radial Basis Function Method.
3. Graduate Student Seminar.
University of Utah, April 7, 2004.
Title: Connecting the Dots: The Role of Polynomial Interpolation in Numerical Analysis.
4. Applied Math Student Seminar.
University of Utah, September 24, 2004.
Title: Interpolation in Multiple Dimensions via Radial Basis Functions (RBFs)
5. First International Conference on Computational Methods.
Singapore, December 15-17, 2004.
Title: Scattered Node Compact Finite Difference-type Formulas Generated from Radial Basis Function.
6. Department of Mathematics Colloquium.
Colorado School of Mines, Golden, CO, February 7, 2005.
Title: Scattered Node Finite Difference-Type Formulas Generated from Radial Basis Functions.
7. Department of Mathematics Colloquium.
Illinois Institute of Technology, Chicago, IL, March 21, 2005.
Title: Scattered Node Finite Difference-Type Formulas Generated from Radial Basis Functions.
8. SIAM Conference on Geometric Design and Computing.
Phoenix, AZ, October 30 – November 3, 2005.
Organizer for minisymposium “Radial Basis Functions: Theory and Computation”.
Title: A Multilevel Method for the Fast Evaluation of Smooth Radial Basis Function Expansions.
9. Department of Mathematics Colloquium.
Boise State University, February 17, 2006.

- Title: Recent developments in radial basis functions interpolation with applications to the geosciences.
10. Approximation theory seminar.
University of Utah, October 17, 2006.
Title: Radial Basis Functions I: An overview.
 11. Approximation theory seminar.
University of Utah, October 31, 2006.
Title: Radial Basis Functions II: Approximation on the Sphere with Applications to the Geosciences.
 12. SIAM Conference on Mathematical and Computational Issues in the Geosciences.
Santa Fe, NM, March 19-22, 2007.
Co-organizer for minisymposium “Radial Basis Functions on the Sphere for Geophysical Applications”.
Title: Transport Schemes on the Sphere Using Radial Basis Functions.
 13. Applied Math Seminar.
University of Utah, April 16, 2007.
Title: An Efficient and Robust Method for Simulating Two-Phase Gel Dynamics.
 14. Graduate Student Seminar.
Boise State University, September 12, 2007.
Title: An Introduction to Radial Basis Function Approximation with Applications to Geophysics.
 15. Special colloquium in commemoration of Gene H. Golub.
Boise State University, February 29, 2008.
Title: Probability, linear algebra, and numerical analysis: the mathematics behind Google's PageRank.
 16. 10th Copper Mountain Conference on Iterative Methods.
Copper Mountain, Colorado, April 6-11, 2008. Contributed.
Title: A Robust Multigrid Preconditioner for Two Phase Gel Dynamics.
 17. Petascale Computing Workshop: Its Impact on Geophysical Modeling and Simulation.
National Center for Atmospheric Research (NCAR) Boulder, CO, May 5-7, 2008. Invited.
Title: Customized Approximation with Radial Basis Functions.
 18. PDEs on the Sphere.
Santa Fe, NM, April 27-30, 2009. Invited.
Title: RBF approximation of vector functions and their derivatives on the sphere with applications to solving PDEs.
 19. College of Engineering Seminar.
Boise State University, May 14, 2009. Invited.
Title: From biological fluid dynamics to geophysical fluid dynamics: An overview of some new computational methodologies.
 20. European Conference on Numerical Mathematics and Advanced Applications (ENUMATH).
Uppsala University, Sweden, June 29-July 3, 2009. Invited.
Title: RBF approximation of vector functions and their derivatives on the sphere with applications.
 21. Graduate Student Seminar.
Boise State University, November 18, 2009.
Title: Scattered node finite difference-type formulas generated from radial basis functions with applications.
 22. Material Science and Engineering Seminar.
Boise State University, February 12, 2010. Invited.
Title: Numerical modeling of biogels.
 23. Mathematics Colloquium
University of Wyoming, April 22, 2010. Invited.
Title: Computational models for gel dynamics.
 24. Optimal Configurations on the Sphere and Other Manifolds
Vanderbilt University, May 17-20. Contributed.
Title: Geophysical modeling on the sphere with radial basis functions.
 25. Pacific Northwest Numerical Analysis Seminar
Washington State University, October 2, 2010. Invited.
Title: Computational techniques for simulating gel dynamics.
 26. Applied Math Seminar

- University of California, Davis, November 17, 2010. Invited.
Title: A computational method for simulating viscoelastic gel dynamics.
27. Applied Math Seminar
 University of Utah, January 21, 2011. Invited.
Title: Reconstruction and decomposition of vector fields on the sphere with applications.
28. International Symposium in Approximation Theory
 Vanderbilt University, May 17-21. Invited.
Title: A kernel method for solving parabolic differential equations on surfaces.
29. NSF-CBMS Regional Conference: Radial Basis Functions Mathematical Developments and Applications.
 University of Massachusetts, Dartmouth, June 20-24, 2011. Invited supplementary lecture.
Title: An algorithm for stable computations with flat radial basis functions.
30. ICIAM 2011
 Vancouver, British Columbia, Canada, July 18-22, 2011.
 Co-organizer of minisymposium: Complex Fluid Models and Computational Methods for Gel Mechanics
Title: A Method for Simulating Two-fluid, Viscoelastic Gel Dynamics.
31. Second Annual CAES Workshop on Modeling, Simulation, and Visualization.
 Boise, ID, September 8-9, 2011.
Title: Applications of kernel approximation to modeling and simulation.
32. Workshop on Mathematics in the Geosciences.
 Northwestern University, Evanston, IL, October 3-6, 2011. Invited.
Title: Radial Basis Functions for Computational Geosciences
33. American Mathematical Society Western Section Meeting 2012.
 University of Hawaii, Honolulu, HI, March 3-4, 2012. Invited.
Title: Solving Partial Differential Equations on Surfaces with Kernels.

POSTERS

- SAMSI Conference on Multiscale Model Development and Control Design.
 Research Triangle Park, NC, January 17-20, 2004. Contributed.
 G.B. Wright. Stable computation of flat radial basis functions.
- AGU Fall Meeting.
 San Francisco, CA, December 15-19, 2008. Contributed.
 G.B. Wright, N. Flyer, and D.A. Yuen. 3-D spherical mantle convection with radial basis functions.
- Opportunities and Challenges in Computational Geophysics workshop.
 California Institute of Technology, Pasadena, CA, March 30-31, 2009. Contributed.
 G.B. Wright, N. Flyer, and D.A. Yuen. 3-D Spherical Mantle Convection with Radial Basis Function.
- EGU General Assembly.
 Vienna, Austria, April 19-24, 2009. Contributed. Abstract ID EGU2009-13753
 N. Flyer, G.B. Wright, and D.A. Yuen. High Rayleigh number 3-D spherical mantle convection with radial basis functions.
- AGU Joint Assembly.
 Toronto, Canada, May 24-27, 2009. Contributed. Abstract ID DI11A-04
 G.B. Wright, N. Flyer, D.A. Yuen, M. Monnereau, and S. Zhang. Onset of Time-Dependent 3-D spherical Mantle Convection using a Radial Basis Function-Pseudospectral Method; Spectral-Finite Volume; Spectral Higher-Order Finite-Difference Methods.
- Undergraduate Research and Scholars Conference.
 Boise State University, April 20, 2009
 G.A. Barnett and G.B. Wright. Numerical Methods for Thermal Convection with Applications to the Earth's Mantle.
- AGU Fall Meeting.
 San Francisco, CA, December 14-18, 2009. Contributed. ID DI31A-1600
 G.A. Barnett, G.B. Wright, and D.A. Yuen. GPU implementation for three-dimensional mantle convection at high Rayleigh number.

8. AGU Fall Meeting.
San Francisco, CA, December 5-9, 2011. Contributed. Abstract ID EP21D-07
K.E. Riley, J.L. Pierce, A.J. Hopkins, and G.B. Wright. Wildfires, debris flows, and climate: Using modern and ancient deposits to reconstruct Holocene sediment yields in central Idaho.
9. AGU Fall Meeting.
San Francisco, CA, December 5-9, 2011. Contributed. Abstract ID DI23A-2077
N. Flyer, G.B. Wright, P. Arrial, and L.H. Kellogg. On the instability of classical steady-state solutions for mantle convection in 3D spherical shells.
10. EGU General Assembly 2012.
Vienna, Austria, April 22-27, 2012. Contributed. Abstract ID EGU2012-5368
U. Harlander, G. B. Wright, and C. Egbers. Reconstruction of the 3D flow field in a differentially heated rotating annulus laboratory experiment.

TEACHING EXPERIENCE

- **Object-Oriented Programming and Mathematical Algorithms with Java**, University of Colorado, Boulder, Spring 2002.
- **Introduction to Numerical Analysis I**, University of Utah, Fall 2003 and Fall 2005.
- **Introduction to Numerical Analysis II**, University of Utah, Spring 2004 and Spring 2006.
- **Applied Complex Variables**, University of Utah, Fall 2004 and Fall 2006.
- **A Survey of Numerical Analysis**, University of Utah, Spring 2005.
- **Intermediate Algebra**, University of Utah, Spring 2007.
- **Complex Variables**, Boise State University, Fall 2007.
- **Calculus I**, Boise State University, Fall 2007 and Fall 2008.
- **Complex Analysis**, Boise State University, Spring 2008.
- **Calculus II**, Boise State University, Spring 2008.
- **Scientific Computing**, Boise State University, Fall 2008.
- **Numerical Analysis I**, Boise State University, Fall 2009.
- **Numerical Analysis II**, Boise State University, Spring 2010.
- **Intro to Computational Mathematics**, Boise State University, Spring 2010–Spring 2012.
- **Linear Algebra**, Boise State University, Fall 2010.
- **Partial Differential Equations**, Boise State University, Spring 2012.

SERVICE

- **Organizer, Applied Math Seminar, University of Utah, Fall 2003-Spring 2007.**
- **Organizer, Numerical Analysis Seminar**, University of Utah, Fall 2003-Spring 2007.
- **Co-Organizer, NSF REU Summer Program on Inverse Problems**, University of Utah, Summer 2004.
- **Advisor, NSF REU Project for Ira Burton**, University of Utah, AY 2004-2005
- **Minisymposium Organizer, SIAM Conference on Geometric Design and Computing**, Fall 2005.
- **Advisor, NSF REU Project for Eric Heisler**, University of Utah, AY 2006-2007.
- **Minisymposium Organizer, SIAM Conference on Mathematical and Computational Issues in the Geosciences**, Spring 2007.
- **Mathematics Academic Advisor**, Boise State University, Fall 2007-present.
- **Member, Applied Math Committee**, Boise State University, Fall 2007-present.
- **Member, Core Course Subcommittee of the Graduate Committee**, Boise State University, Fall 2007.
- **Member, Applied Math Subcommittee of the Graduate Committee**, Boise State University, Fall 2007.
- **Member, Visiting Position Hiring Committee**, Boise State University, Spring 2008.
- **Advisor, NSF REU Project for Gregory Barnett**, Boise State University, AY 2008-2009.
- **Member, Master's Thesis Committee for Garrett Saunders**, Boise State University, 2008-2009.
- **Member, Master's Thesis Committee for Eric Smith**, Boise State University, 2008-2009.
- **Member, MATH 333 Curriculum Committee**, Boise State University, Spring 2008-Fall 2008.

- **Member, Applied Math Hiring Committee**, Boise State University, Fall 2009-Spring 2010.
- **Member, Natural Sciences Curriculum Committee**, Boise State University, Fall 2009-Present.
- **Member, University Curriculum Committee**, Boise State University, Fall 2009-Present.
- **Chair/Advisor, Master's Thesis Committee for Joseph Lohmeier**, Boise State University, 2009-2011.
- **Panel reviewer, National Science Foundation.**
- **Mail reviewer, National Science Foundation.**
- **Advisor, NSF REU Project for Kevin Aiton**, Boise State University, 2010-2011.
- **Co-founder and current co-organizer for GEMRES:** Gem State Computational Research in Modeling and Simulation (<http://www.gemres.org>).
- **Referee for the following journals:**
SIAM Journal of Scientific Computing, SIAM Journal of Numerical Analysis, Journal of Computational Physics, Journal of Computational Biology, Advances in Computational Mathematics, Computer Methods in Applied Mechanics and Engineering, International Journal for Numerical Methods in Fluids, Journal of Computational and Applied Mathematics, Numerical Methods for Partial Differential Equations, Computers and Mathematics with Applications, Boundary Value Problems, Academic Press.

HONORS

- Outstanding instructor of mathematics, University of Utah (Fall 2006)
- Outstanding instructor of mathematics, University of Utah (Spring 2005)
- George S. and Dolores Doré Eccles Foundation Scholarship, Westminster College (1993-1997)
- Board of Trustees Scholarship, Westminster College (1993-1997)
- Participant in the IAS/Park City Mathematics Institute (PCMI) summer undergraduate program (1997)
- Outstanding Mathematics and Science Major award, Westminster College (1996-1997)

PROFESSIONAL MEMBERSHIP

- **Society for Industrial and Applied Mathematics (SIAM)**, 2000-Present.
- **American Geophysical Union**, 2009-Present.