

Boise State University
Department of Mathematics
1910 University Dr.
Boise, ID 83725-1555

Tel: +1 208 426-4674
Fax: +1 208 426-1356
E-mail: gradywright@boisestate.edu
Web: <http://gradywright.github.io>

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

7/16-Present **Professor** – Boise State University
9/22-Present **Co-director Computing PhD Program** – Boise State University
5/22-8/22 **Visiting Researcher, Dept. of Information Technology** – Uppsala University
7/11-6/16 **Associate Professor** – Boise State University
7/11-7/18 **Affiliated Faculty, Center for Geophysical Investigation of the Shallow Subsurface (CGISS)** – Boise State University
1/14-7/14 **Visiting Research Fellow – Mathematical Institute**, University of Oxford
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

SCHOLARLY ACTIVITY

RESEARCH AREAS

Computational Math, Scientific Computing, Numerical Methods for PDEs, Approximation Theory, Numerical Linear Algebra, Kernel Methods, High order and Spectral Methods, Computational Fluid Dynamics, Mathematical Biology, and Computational Geosciences

GRANTS/AWARDS

- **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: \$45,715.
- **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: 9/2009-9/2014. Total award: \$1,000,000. Award to Boise State University: \$208,360.
- **NVIDIA CUDA Research Center Program**. GPU Computing Research at Boise State University. Co-PI. Duration: 2011-2015.
- **National Science Foundation grant (DMS 1242876)**. Pacific Northwest Numerical Analysis Seminar 2012. Co-PI. Duration: 8/2012-8/2013. Award to Boise State University: \$8,200.
- **National Science Foundation grant (DMS 1160379)**. FRG: Collaborative Research: Chemically-active Viscoelastic Mixture Models in Physiology: Formulation, Analysis, and Computation. PI. Duration: 9/15/2012 – 8/31/2016. Total award: \$1,100,000. Award to Boise State University: \$107,000.
- **National Science Foundation grant (ACI 1440638)**. SI2-SSE: GEM3D: Open-source Cartesian adaptive complex terrain atmospheric flow solver for GPU clusters. Co-PI. Duration: 10/2014-9/2017. Total award Boise State Award: \$500,000.
- **NASA Idaho Space Grant Consortium grant (ISGC 3065010)**. Research Experience for Undergraduates in Computational Science: Massively Parallel Iterative Solvers for Computational Fluid Dynamics. PI. Duration 5/17 – 4/18. Award to Boise State University: \$24,996.
- **National Science Foundation grant (CCF 1717556)**. AF: Small: Collaborative Research: Scalable, high-order mesh-free algorithms applied to bulk-surface biomechanical problems. PI. Duration: 8/2017 – 8/2021. Award to Boise State University: \$244,417.
- **National Science Foundation grant (DMS 1952674)**. Collaborative Research: Optimal-Complexity Spectral Methods for Complex Fluids. PI. Duration: 7/2020 – 7/2023. Award to Boise State University: \$100,000.
- **National Science Foundation grant (DMS 2309712)**. Fredholm Alternative Quadrature: A Novel Framework for Numerical Integration Over Geometrically Complex Domains. PI. Duration: 7/2023 – 6/2026. Award to Boise State University: \$288,741.
- **Banff International Research Station (BIRS)**. Five-day workshop: Kernel Approximation and Gaussian Processes: Integrating and Expanding Perspectives. Lead Organizer. September 2026.

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.
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.

¹Preprints available for download at <http://gradywright.github.io>

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. Comput. 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.
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.
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.* 231 (2012), 4078-4095.
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.* 50 (2012), 1753-1776.
20. 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. *Appl. Numer. Math.* 63 (2013), 58-77.
21. E.J. Fuselier and G.B. Wright. A High-Order Kernel Method for Diffusion and Reaction-Diffusion Equations on Surfaces. *J. Sci. Comput.* 56 (2013), 535-565.
22. J. Du, R.D. Guy, A.L. Fogelson, G.B. Wright, and J.P. Keener. An interface-capturing regularization method for solving the equations for two-fluid mixtures. *Commun. Comput. Phys.*, 14 (2013), 1322-1346.
23. E. Fuselier, T. Hangelbroek, F.J. Narcowich, J.D. Ward, and G.B. Wright. Localized bases for kernel spaces on the unit sphere. *SIAM J. Numer. Anal.*, 51 (2013), 2538-2562.
24. E. Fuselier, T. Hangelbroek, F.J. Narcowich, J.D. Ward, and G.B. Wright. Kernel based quadrature on spheres and other homogeneous spaces. *Numer. Math.*, 127 (2014), 57-92.
25. V. Shankar, G.B. Wright, A.L. Fogelson, and R.M. Kirby. A radial basis function (RBF)-finite difference method for the simulation of reaction-diffusion equations on stationary platelets within the augmented forcing method. *Int. J. Numer. Meth. Fluids*, 75 (2014), 1-22.
26. P-A. Arrial, N. Flyer, G.B. Wright, and L.H. Kellogg. On the sensitivity of 3D thermal convection codes to numerical discretization: A model intercomparison. *Geosci. Model Dev.*, 7 (2014), 2065-2076.
27. N. Flyer, G.B. Wright, and B. Fornberg. Radial Basis Function-generated Finite Differences: A Mesh-free Method for Computational Geosciences. *Handbook of Geomathematics*, 2nd Edition. Springer 2015. doi: 10.1007/978-3-642-27793-1_61-1.
28. E.J. Fuselier and G.B. Wright. Order-preserving derivative approximation with periodic radial basis functions. *Adv. Comput. Math.* 41 (2015), 23-53.

29. V. Shankar, G.B. Wright, A.L. Fogelson, and R.M. Kirby. A radial basis function (RBF)-finite difference (FD) method for diffusion and reaction-diffusion equations on surfaces. *J. Sci. Comput.*, 63 (2015), 745-768.
30. V. Shankar, G.B. Wright, A.L. Fogelson, and R.M. Kirby. Augmenting the Immersed Boundary Method with Radial Basis Functions (RBFs) for the Modeling of Platelets in Hemodynamic Flows. *Int. J. Numer. Meth. Fluids*, 79 (2015), 536-557.
31. G. B. Wright, M. Javed, H. Montanelli, and L.N. Trefethen. Extension of Chebfun to periodic functions. *SIAM J. Sci. Comput.*, 37 (2015), C554-C573.
32. E.J. Fuselier, V. Shankar, and G. B. Wright. A High-Order Radial Basis Function (RBF) Leray Projection Method for the Solution of the Incompressible Unsteady Stokes. *Comput. Fluids*, 128 (2016), 41-52.
33. A. Townsend, H. Wilber, and G. B. Wright, Computing with functions in spherical and polar geometries I. The sphere. *SIAM J. Sci. Comput.*, 38-4 (2016), C403-C425.
34. E.J. Fuselier and G. B. Wright. A radial basis function method for computing Helmholtz-Hodge decompositions. *IMA J. Numer. Anal.*, 37-2 (2017), 774-797.
35. G. B. Wright and B. Fornberg. Stable computations with flat radial basis functions using vector-valued rational approximations. *J. Comput. Phys.*, 331 (2017), 137-156.
36. A. Townsend, H. Wilber, and G. B. Wright. Computing with functions in spherical and polar geometries II. The disk. *SIAM J. Sci. Comput.*, 39-4 (2017), C238-C262.
37. E. Lehto, V. Shankar, and G.B. Wright. A radial basis function (RBF) compact finite difference (FD) scheme for reaction-diffusion equations on surfaces. *SIAM J. Sci. Comput.*, 39-5 (2017), A2129-A2151.
38. V. Shankar and G. B. Wright. Mesh-free semi-Lagrangian methods for transport on a sphere using radial basis functions. *J. Comput. Phys.*, 366 (2018), 170-190.
39. K. P. Drake and G. B. Wright, A fast and accurate algorithm for spherical harmonic analysis on HEALPix grids with applications to the cosmic microwave background radiation. *J. Comput. Phys.*, 416 (2020).
40. K. P. Drake and G. B. Wright. A stable algorithm for divergence-free radial basis functions in the flat limit. *J. Comput. Phys.*, 417 (2020).
41. V. Shankar, G. B. Wright, and A. Narayan. A robust hyperviscosity formulation for stable RBF-FD discretizations of advection-diffusion-reaction equations on manifolds. *SIAM J. Sci. Comput.*, 42(4), A2371-A2401 (2020).
42. K. P. Drake, E. J. Fuselier, and G. B. Wright. A partition of unity method for divergence-free or curl-free radial basis function approximation. *SIAM J. Sci. Comput.*, 43(3), A1950-A1974 (2021).
43. V. Shankar, G. B. Wright, and A. L. Fogelson. An efficient high-order meshless method for advection-diffusion equations on time-varying irregular domains. *J. Comput. Phys.*, 445 (2021).
44. K. P. Drake, E. J. Fuselier, and G. B. Wright. Implicit surface reconstruction with a curl-free radial basis function partition of unity method. *SIAM J. Sci. Comput.*, 42, A3018-A3040 (2022).
45. G. B. Wright, A. M. Jones, and V. Shankar. MGM: A meshfree geometric multilevel method for systems arising from elliptic equations on point cloud surfaces. *SIAM J. Sci. Comput.*, 45, A312-A337 (2023).
46. A. M. Jones, P. A. Bosler, P. A. Kuberry, and G. B. Wright. Generalized moving least squares vs. radial basis function finite difference methods for approximating surface derivatives. *Comput. Math. Appl.* 147, 1--13 (2023).
47. T. Hangelbroek, C. Rieger, and G. B. Wright. Spectral stability and perturbation results for kernel differentiation matrices on the sphere. *Numer. Math.*, Accepted (2024).
48. M. Chiwere and G. B. Wright. Barycentric interpolation formulas for the sphere and the disk. *BIT*, Accepted (2024).
49. L. Li, J. McClure, G. B. Wright, J. P. Whitehead, J. Wang, and Z. Pan. Error propagation of direct pressure gradient integration and a Helmholtz-Hodge decomposition based pressure field reconstruction method for image velocimetry. *Exp. Fluids*, In Revision (2024).
50. T. Hangelbroek, C. Rieger, and G. B. Wright. Generalized local polynomial reproductions. Submitted (2024)

REFEREED 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. 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. *16th Int. Symp on Appl. Laser Techniques to Fluid Mechanics*, Lisbon, Portugal, July 09 – 12, 2012.
3. D.A. Sanchez², C. Gonzalez², D.A. Yuen, G.B. Wright, and G. Barnett². High Rayleigh Number Mantle Convection on GPU. *GPU Solutions to Multi-Scale Problems in Science and Engineering*, D.A. Yuen, L. Wang, X. Chi, L. Johnsson, W. Ge, and Y. Shi, eds. Springer, Berlin, 2013, 335-352.
4. U. Harlander, Th. von Larcher, G.B. Wright, M. Hoff, K. Alexandrov, C. Egbers. Orthogonal Decomposition Methods to Analyze PIV, LDV, and Thermography Data of Thermally Driven Rotating Annulus Laboratory Experiments. *Modeling Atmospheric and Oceanic flows: Insights from Laboratory Experiments and Numerical Simulations*. T. von Larcher and P. D. Williams, eds. American Geophysical Union (AGU) Book Series, Wiley, 2014. doi: 10.1002/9781118856024.ch17.

NON-REFEREED ITEMS

1. G. B. Wright and L.N. Trefethen. Periodic Chebfuns. *Chebfun Guide*, T.A. Driscoll, N. Hale, and L.N. Trefethen, eds. Pafnuty Publications, Oxford, 2014, Chapter 11.
2. A. Townsend, H. Wilber, and G. B. Wright. Sphrefun. *Chebfun Guide*, T.A. Driscoll, N. Hale, and L.N. Trefethen, eds. Pafnuty Publications, April, 2017, Chapter 17.

TECHNICAL REPORTS

1. O.E. Livne and G.B. Wright. Fast multilevel evaluation of 1-D piecewise smooth radial basis function expansions. Manuscript originally refereed and accepted to the *SIAM Proceedings Geometric Design and Computing, Phoenix 2005*. These proceedings were never published.
2. 27 Total Authors. Fostering Interactions Between the Geosciences and Mathematics, Statistics, and Computer Science. *Technical Report UC/CS TR-2012-02*, Dept. Comp. Sci., Univ. Chicago, 2012.

OPEN-SOURCE SOFTWARE

- Chebfun – contributing developer (www.chebfun.org)
- CFPU – lead developer (<https://github.com/gradywright/cfpu>)
- KernelDMSuite – lead developer (<https://github.com/gradywright/kerneldmsuite>)
- MGM – lead developer (<https://github.com/gradywright/mgm>)
- SpherePts – lead developer (<https://github.com/gradywright/spherepts>)
- ThunderEgg – contributing developer (<https://github.com/ThunderEgg/ThunderEgg>)

PRESENTATIONS

RESEARCH TALKS (CHRONOLOGICAL ORDER)

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

² Undergraduate student at time of submission.

- 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, 2010. 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, 2011. 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. Invited
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
34. Computational Math Seminar
Arizona State University, March 30, 2012. Invited
Title: A high-order kernel method for partial differential equations on surfaces
35. Applied Math Seminar
SUNY Buffalo, April 10, 2012. Invited
Title: A high-order kernel method for partial differential equations on surfaces
36. Eigenvalues/singular values and fast PDE algorithms: acceleration, conditioning, and stability
Banff International Research Station, Alberta, Canada, June 24-29, 2012. Invited
Title: A Radial Basis Function Partition of Unity Method for Transport on the Sphere
37. SIAM Annual Meeting 2012
Minneapolis, MN, USA, July 9-13, 2012. Invited minisymposium talk (MS3)
Title: A Partition of Unity Method for Divergence-free Approximation of Vector Fields on the Sphere
38. Workshop: Bridging the Gap Between the Geosciences and Mathematics, Statistics, and Computer Science

- Princeton University, NJ, USA, Oct 1-2, 2012. Co-organizer and contributed speaker
Title: Can Problems in the Geosciences Inspire Fundamental Research in the Mathematical Sciences?
39. 14th International Conference on Approximation Theory
San Antonio, TX, April 7-10, 2013. Invited plenary speaker
Title: Approximation on Surfaces with Kernels: Recent Developments and Applications
40. SIAM Annual Meeting 2013
San Diego, CA, USA, July 8-12, 2013. Minisymposium co-organizer (MS10,MS24,MS37) and speaker
Title: A comparison between RBF-FDM and RBF-PUM for shallow water flows on the sphere
41. Seminar, Dept. of Geosciences
Boise State University, Oct. 21, 2013. Invited
Title: Radial basis functions: A mesh-free modeling framework for computational geosciences
42. Seminar, Numerical Analysis Group
University of Oxford, Feb. 6, 2014. Invited
Title: Approximation on surfaces with radial basis functions: from global to local methods
43. Seminar, Numerical Analysis Group
University of Manchester, Mar. 14, 2014. Invited
Title: Solving PDEs on surfaces with radial basis functions: from global to local methods
44. Seminar, Numerical Analysis Group
University of Padua, Apr. 10, 2014. Invited
Title: Solving PDEs on surfaces with radial basis functions: from global to local methods
45. 8th International Conference on Curves and Surfaces
Paris, France, June 14, 2014. Invited plenary speaker
Title: Kernel based approximation on surfaces: from global to local methods
46. SIAM Conference on Computational Science and Engineering (CSE) 2015
Salt Lake City, Utah, March 14-18, 2015. Minisymposium organizer and speaker
Title: A rational approximation algorithm for stable computations with flat RBFs
47. SRC 2015 *Ten Talks*
Boise State University, June 18, 2015. Invited
Title: Computational Models of Biological Gels
48. New Directions in Numerical Computation
University of Oxford, Aug. 25-28, 2015. Contributed
Title: An Extension of Chebfun to spheres and disks
49. Mathematics Colloquium
Vanderbilt University, Nov. 11, 2015. Invited
Title: Computing with functions on the sphere using low rank approximations
50. Applied Math Seminar
MIT, Dec. 7, 2015. Invited
Title: Computing with functions on the sphere using low rank approximations
51. 15th International Conference on Approximation Theory
San Antonio, Texas, May 23, 2016. Invited
Title: Optimal complexity spectral methods for partial differential equations on the sphere and disk
52. 9th International Conference on Mathematical Methods for Curves and Surfaces
Tønsberg, Norway, June 24, 2016. Invited
Title: Numerically solving time-dependent PDEs on the sphere with a RBF partition of unity method
53. 4th Dolomites Workshop on Constructive Approximation and Applications
Alba di Canazei, Italy, Sept. 12, 2016. Invited plenary speaker
Title: Low rank approximation of functions in polar and spherical geometries
54. Mathematics Colloquium
University of Idaho, April 14, 2017. Invited
Title: Low rank approximation of functions in polar and spherical geometries
55. Modeling Complex Fluids and Gels for Biological Applications
University of Utah, May 6, 2017. Invited speaker
Title: Meshfree methods for numerically solving PDEs on surfaces

56. IMAGe Theme of the Year 2017: Workshop on Multiscale Geoscience Numerics
National Center for Atmospheric Research, Boulder, Colorado, May 17, 2017. Invited speaker
Title: Semi-Lagrangian Methods for Transport on a Sphere Using Radial Basis Functions
57. 27th Biennial Conference on Numerical Analysis
Strathclyde, Scotland, June 24, 2017. Minisymposium co-organizer and speaker
Title: A high-order meshfree method for advection dominated PDEs on surfaces
58. ICERM Workshop: Localized Kernel-Based Meshless Methods for Partial Differential Equations
Providence, Rhode Island, August 20, 2017. Invited speaker
Title: Meshfree semi-Lagrangian methods for transport on spheres and other surfaces
59. 2017 SIAM Pacific Northwest Regional Conference
Oregon State University, October 28, 2017. Invited plenary speaker
Title: Computing with functions in polar and spherical geometries
60. Scientific Computing Colloquium
Uppsala University, Sweden. January 17, 2018. Invited
Title: Meshfree semi-Lagrangian methods for transport on spheres and other surfaces
61. International Conference on Spectral and High Order Methods
Imperial College, London, UK, July 9-13, 2018. Invited
Title: Localized high-order meshfree methods for semi-Lagrangian advection on surfaces
62. Meshfree and Particle Methods: Applications and Theory
Santa Fe, New Mexico, September 10-12, 2018. Invited
Title: Localized high-order meshfree methods for semi-Lagrangian advection on surfaces
63. SIAM Conference on Computational Science and Engineering (CSE) 2019
Spokane, Washington, February 25 - March 1, 2019. Minisymposium organizer and speaker
Title: A High-order Meshfree Semi-Lagrangian Method for Advection on Manifolds: Mass-conservation
64. 16th International Conference on Approximation Theory
Nashville, Tennessee, May 19 – 12, 2019. Minisymposium co-organizer and speaker
Title: Localized Meshfree Semi-Lagrangian Advection Schemes for Transport on Surfaces
65. European Numerical Mathematics and Advanced Applications Conference 2019
Egmond aan Zee, Netherlands, September 30 – October 4, 2019. Invited
Title: Radial basis function finite differences for solving PDEs on surfaces
66. 2nd Biennial Meeting of the SIAM Pacific Northwest Section
Seattle, Washington, October 18 – 20, 2019. Minisymposium co-organizer and speaker
Title: Radial basis function finite differences for solving PDEs on surfaces
67. American Mathematical Society Western Section Meeting 2020
University of Utah, Virtual, October 2020. Invited
Title: A meshfree partition of unity method for divergence-free/curl-free approximation
68. SIAM Conference on Mathematical & Computational Issues in the Geosciences
Politecnico di Milano, Italy (Virtual), June 2021. Invited
Title: Reconstructing Divergence-Free or Curl-Free Vector Fields using a Meshfree Partition of Unity Method
69. 5th Dolomites Workshop on Constructive Approximation and Applications
Virtual, September 2021. Invited
Title: Implicit surface reconstruction with a curl-free radial basis function partition of unity method
70. SIAM Conference on Geometric and Physical Modeling
Virtual, September 2021. Minisymposium co-organizer and speaker
Title: Implicit surface reconstruction with a curl-free radial basis function partition of unity method
71. SIAM Conference on Analysis of Partial Differential Equations
Virtual, March 2022. Invited
Title: A meshfree geometric multilevel (MGM) method for RBF-FD discretizations of elliptic equations on surfaces
72. 3rd Biennial Meeting of the SIAM Pacific Northwest Section
Vancouver, Washington, May 20 – 22, 2022. Minisymposium co-organizer and speaker
Title: Fredholm Alternative Quadrature
73. SIAM Conference on Computational Science and Engineering (CSE) 2023

Amsterdam, Netherlands, February 28 - March 2, 2023. Invited minisymposium speaker

Title: MGM: A meshfree geometric multilevel method of elliptic equations on surfaces

74. 4th Biennial Meeting of the SIAM Pacific Northwest Section

Bellingham, Washington, Oct 13 – 15, 2023. Minisymposium co-organizer and speaker

Title: MGM: A meshfree geometric multigrid method for unstructured grids and point clouds

75. Colloquium, Department of Mathematics, Tulane University, April 5, 2024

Title: A geometric multigrid method for unstructured grids and point clouds

76. Colloquium, Department of Mathematics, Auburn University, April 12, 2024

Title: A new framework for numerical integration

77. SIAM Conference on Mathematics of Planet Earth 2024

Portland, Oregon, Jun 10 – 12, 2024. Invited minisymposium speaker

Title: A geometric multigrid method for unstructured discretization on the sphere

WORKSHOPS LECTURES

1. Dolomites Research Week on Approximation

Alba di Canazei, Italy, Sept. 9-13, 2013. Principal lecturer for 7 tutorials

Lecture series: Kernel approximation on the sphere with applications to computational geosciences

2. Montestigliano Workshop

Stigliano, Tuscany, Italy, April. 13-19, 2014. Principal lecturer

Lecture series: Radial Basis Function Methods for Scientific Computing

RESEARCH POSTERS

1. 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

2. 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

3. 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

4. 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

5. 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

6. 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

7. 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
11. SIAM Annual Meeting 2012
Minneapolis, MN, USA, July 9-13, 2012. Contributed
G. B. Wright and K. Aiton. A Radial Basis Function Partition of Unity Method for Transport on the Sphere
12. Pacific Northwest Numerical Analysis Seminar 2012
Boise, ID, USA, October 27, 2012. Contributed
G. B. Wright and K. Aiton. A Radial Basis Function Partition of Unity Method for Transport on the Sphere
13. AGU Fall Meeting
San Francisco, CA, December 9-13, 2013. Contributed. Abstract ID DI31A-2193
P.A. Arrial, N. Flyer, G.B. Wright, L. H. Kellogg. Mantle convection benchmarking in a 3D spherical shell: on the transitional behavior of polyhedral pattern formations
14. AGU Fall Meeting
San Francisco, CA, December 9-13, 2013. Contributed. Abstract ID DI31A-2212
N. Flyer, J. Mead, F.J. Simons, S. Stein, G.B. Wright, D.A. Yuen. CMG++: Consortium for Mathematics in the Geosciences Promoting the development and application of mathematics, statistics, and computational sciences to the geosciences
15. SIAM Annual Meeting 2016
Boston, MA, USA, July 11-15, 2016. Contributed
K. P. Drake and G. B. Wright. A Stable Algorithm for Divergence and Curl-Free Radial Basis Functions in the Flat Limit
16. NSF SI2 PI Meeting 2018
Washington, DC April 30 – May 1, 2018
J. Hasbestan, S. Aiton, B. G. B. Wright, D. Calhoun, I. Senocak, and B. Peck. Massively Parallel Solvers for Computational Fluid Dynamics on Multi-block Cartesian Grids
17. SIAM Annual Meeting 2018
Portland, OR, USA, July 9-13, 2018. Contributed
K. P. Drake and G. B. Wright. Fast Algorithms for Cosmic Microwave Background Radiation Data on Healpix Points
18. SIAM Computational Science and Engineering (CSE) 2019
Spokane, WA, USA, February 25 – March 1, 2019. Contributed
S. Aiton, D. Calhoun, G. B. Wright. A Massively Parallel Solver for Poisson's Equation on Block Structured Cartesian Grids
19. SIAM Computational Science and Engineering (CSE) 2019
Spokane, WA, USA, February 25 – March 1, 2019. Contributed
S. B. Shaw and G. B. Wright. A Comparison of RBF-FD Methods for Solving Partial Differential Equations on Surfaces
20. SIAM Computational Science and Engineering (CSE) 2019
Spokane, WA, USA, February 25 – March 1, 2019. Contributed
D. Malmuth and G. B. Wright. Meshfree Semi-Lagrangian Schemes for Advection on Surfaces: Polyharmonic Splines Augmented with Polynomials
21. SIAM Computational Science and Engineering (CSE) 2019
Spokane, WA, USA, February 25 – March 1, 2019. Contributed
K. P. Drake and G. B. Wright. Fast Algorithms for Cosmic Microwave Background Radiation Data on Healpix Points

GRADUATE STUDENTS**PH.D. THESIS ADVISOR**

- **Kathryn Drake**, Boise State University, 2017 – 2020
- **Andrew Jones**, Boise State University, 2018 – 2022
- **Michael Chiwere**, Boise State University, 2020 – Present

M.S. THESIS ADVISOR

- **Joseph Lohmeier**, Boise State University, 2009-2011
- **Kevin Aiton**, Boise State University, 2012-2014
- **David Sanchez**, Boise State University, 2011-2013
- **Heather Wilber**, Boise State University, 2014-2016
- **Kathryn Drake**, Boise State University, 2016-2017
- **Daniel Malmuth**, Boise State University, 2017-2019
- **Sage Shaw**, Boise State University, 2017-2019
- **Karinna Stevenson**, Boise State University, 2024-Present
- **Cole Ridgway**, Boise State University, 2024-Present

PH.D. COMMITTEE MEMBER

- **Varun Shankar**, School of Computing, University of Utah, 2014
- **Arthur Mitrano**, School of Math and Stat., Arizona State Univ., 2016
- **Jim Beck**, Computing PhD Program, Boise State University, 2022
- **Igor Tomenic**, Department of Scientific Computing, Uppsala University, 2022
- **Damyn Chimpman**, Computing PhD Program, Boise State University, 2024
- **Graham Annett**, Computing PhD Program, Boise State University, 2024

REU STUDENTS

- **Gregory Barnett**, Boise State University, AY 2008-2009
 - Dr. Barnett finished his PhD in Applied Mathematics from the University of Colorado, Boulder in June 2015
- **Kevin Aiton**, Boise State University, 2010-2011
 - Dr. Aiton finished his PhD in Applied Mathematics from the University of Delaware in 2019
- **Tommy Long**, Boise State University, Fall 2011
- **Scott Aiton**, Boise State University, Summer 2013-2014. Fall 2016-2020
- **David Darrow**, MIT PRIMES Program, 2017

SERVICE**PROFESSIONAL SERVICE****BOARDS AND ADVISORY COMMITTEES**

- **President, SIAM Pacific Northwest Section**, 2020-2022
- **Treasury, SIAM Pacific Northwest Section**, 2018-2019

CONFERENCE/WORKSHOP ORGANIZATION

- **Co-Organizer, NSF REU Summer Program on Inverse Problems**, University of Utah, Summer 2004
- **Minisymposium Organizer, SIAM Conference on Geometric Design and Computing 2005**, Phoenix, AZ
- **Minisymposium Organizer, SIAM Conference on Mathematical and Computational Issues in the Geosciences 2007**, Santa Fe, NM

- **Minisymposium Organizer, International Congress on Industrial and Applied Mathematics 2011**, Vancouver, BC
- **Minisymposium Co-Organizer, 14th International Conference on Approximation Theory 2013**, San Antonio, TX
- **Co-organizer, Workshop: Bridging the Gap Between the Geosciences and Mathematics, Statistics, and Computer Science**, Princeton University, Fall 2012
- **Co-organizer, 25th Annual Pacific Northwest Numerical Analysis Seminar**, Boise State University, Fall 2012
- **Minisymposium Co-Organizer, SIAM Annual Meeting 2013**, San Diego, CA
- **Minisymposium Organizer, 8th International Conference on Curves and Surfaces 2014**, Paris, France
- **IMA Hot Topics Workshop Co-Organizer, “Impact of Waves Along Coastlines”**, IMA, University of Minnesota, October 2014
- **Conference Co-organizer, CMG++ Roadmap Workshop**, Boise State University, Sept. 18-19, 2014
- **Minisymposium Co-Organizer, SIAM Computational Science and Engineering 2015**, Salt Lake City, five-part minisymposium
- **Conference Co-Organizer, Computational Biofluids in Physiology**, Salt Lake City, May 14-15, 2015
- **Minisymposium Organizer, 9th International Conference on Curves and Surfaces 2016**, Tønsberg, Norway
- **Minisymposium Organizer, 27th Biennial Conference on Numerical Analysis 2017**, Strathclyde, Scotland
- **Minisymposium Organizer, SIAM Computational Science and Engineering 2019**, Spokane, two-part minisymposium
- **Minisymposium Co-Organizer, International Conference on Approximation Theory 16 (AT16)**, Vanderbilt, two-part minisymposium
- **Conference and Minisymposium Co-Organizer, 2nd Biennial SIAM Pacific Northwest Section Meeting**, Seattle University, Oct. 18-20, 2019
- **Conference Co-Organizer, Pacific Northwest Numerical Analysis Seminar**, Virtual, October 13, 2020
- **Minisymposium Co-Organizer, SIAM Conference on Geometric and Physical Modeling**, Title: “Meshfree Methods for Geometric Modeling”, Virtual, Sep. 2021
- **Conference and Minisymposium Co-Organizer, 3rd Biennial SIAM Pacific Northwest Section Meeting**, Washington State Vancouver, May 20-22, 2022
- **Conference and Minisymposium Co-Organizer, 4th Biennial SIAM Pacific Northwest Section Meeting**, Western Washington University, Oct. 13-15, 2023

REFeree/REVIEWER

- **Panel and mail reviewer:** US National Science Foundation (NSF), Natural Sciences and Engineering Research Council (NSERC) of Canada, Research Grants Council (RGC) of Hong Kong
- **Department review**
- **Tenure evaluation**
- **Referee for the following journals:**
SIAM Journal on Scientific Computing, SIAM Journal on Numerical Analysis, SIAM Journal on Matrix Analysis and Applications, SIAM Journal on Imaging Sciences, Journal of Computational Physics, Journal of Scientific Computing, IMA Journal of Numerical Analysis, 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, Numerical Algorithms, Springer Lecture notes in Computer Science, Applied Numerical Mathematics, BIT,

COMMUNITY SERVICE

- **Classroom volunteer**, Liberty Elementary School, Boise, 2011-2016

- **Hiring Committee Numerical Analysis Group**, University of Oxford, Oxford UK, 2014
- **Presentation on fractals for 4-6 graders**, Liberty Elementary School, Boise, Spring 2015

UNIVERSITY SERVICE

STUDENTS

- **Mathematics Academic Advisor**, Boise State University, Fall 2007-present
- **Master's Thesis Committee for Garrett Saunders**, Boise State University, 2008-2009
- **Master's Thesis Committee for Jean Schneider**, Boise State University, 2011-2012
- **Master's Thesis Committee for Chad Hammerquist**, Boise State University, 2011-2012
- **Master's Thesis Committee for John Hutchins**, Boise State University, 2012-2013
- **Master's Thesis Committee for Talin Masihimirzakhian**, Boise State University, 2016-2017

COMMITTEES

- **Applied Math Committee**, Boise State University, Fall 2007-present
- **Core Course Subcommittee of the Graduate Committee**, Boise State University, Fall 2007
- **Applied Math Subcommittee of the Graduate Committee**, Boise State University, Fall 2007
- **Visiting Position Hiring Committee**, Boise State University, Spring 2008
- **MATH 333 Curriculum Committee**, Boise State University, Spring 2008-Fall 2008
- **Applied Math Hiring Committee**, Boise State University, Fall 2009-Spring 2010
- **Natural Sciences Curriculum Committee**, Boise State University, Fall 2009-Spring 2013
- **University Curriculum Committee**, Boise State University, Fall 2009-Spring 2013
- **Math Department Workload Policy Committee**, Boise State University, Fall 2012-Spring 2013
- **Department Chair Selection Committee**, Boise State University, 2014
- **Department Tenure Progress Review Committee**, Boise State University, 2014-2016 (Chair 2016)
- **Department Salary Committee**, Boise State University, 2016
- **Computing Colloquium Committee**, Boise State University, 2016-2019
- **Mathematics Graduate Committee**, Boise State University, 2016-2019
- **Department Hiring Committee (TT)**, Boise State University, 2017-2018 (Chair)
- **Department Hiring Committee (Lecturer)**, Boise State University, 2017
- **Tenure and Promotion Policy Committee**, Boise State University, 2017-2018
- **Computing Admissions Committee**, Boise State University, 2018-present
- **Personnel and Budget Committee**, Boise State University, 2018-present
- **Department Tenure Progress Review Committee**, Boise State University, 2019
- **Colloquium Organizer**, Boise State University, 2019-2021
- **Department Hiring Committee (TT)**, Boise State University, 2019-2021
- **Department Hiring Committee (TT)**, Boise State University, 2022-2023
- **School of Computing Organizing Committee**, Boise State University, 2023-2024

ACADEMIC DEVELOPMENT

- **MATH 365 Intro to Computational Math**: developed course and continue to refine it
- **Computational Science and Engineering Minor**: assisted Dr. Senocak with developing this new minor and serving as one of the math department contacts for students pursuing it

HONORS

- Invited Plenary Speaker, 2017 SIAM Pacific Northwest Regional Conference
Oregon State University, October 27-29, 2017
- Invited Plenary Speaker, 4th Dolomites Workshop on Constructive Approximation and Applications
Alba di Canazei, Italy, Sept. 8-13, 2016
- Invited Plenary Speaker, 8th International Conference on Curves and Surfaces, Paris, June 12-18, 2014

- Invited Plenary Speaker, 14th International Conference on Approximation Theory, San Antonio, TX, April 7-10, 2013
- Outstanding instructor of mathematics, University of Utah (Fall 2006)
- Outstanding instructor of mathematics, University of Utah (Spring 2005)

PROFESSIONAL MEMBERSHIP

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