

Béatrice M. Rivière

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Experience

- **Chair**, Department of Computational and Applied, Mathematics, Rice University (2015 - present).
- **Noah Harding Chair**, Department of Computational and Applied, Mathematics, Rice University (2015 - present).
- **Professor**, Department of Computational and Applied Mathematics, Rice University (2013 - present).
- **Visiting Scientist**, Direction de recherche Mécatronique et Numérique, IFPEN (2016).
- **Affiliate Member Faculty**, McGowan Institute for Regenerative Medicine, University of Pittsburgh (2005-2014).
- **Visiting Professor**, IWR, Interdisciplinary Center for Scientific Computing, University of Heidelberg (2014).
- **Associate Professor**, Department of Computational and Applied Mathematics, Rice University (2008 - 2013).
- **Associate Professor**, Department of Mathematics, The University of Pittsburgh (2007 - 2008).
- **Assistant Professor**, Department of Mathematics, The University of Pittsburgh (2002 - 2007).
- **Post-Doctoral Fellow**, Texas Institute for Computational and Applied Mathematics, The University of Texas at Austin (2000 - 2002)
- **Research Assistant**, Texas Institute for Computational and Applied Mathematics, The University of Texas at Austin (1997 - 2000)
- **Teaching Assistant**, The University of Texas at Austin (1996 - 1997), The Pennsylvania State University (1994 - 1996).

Research Grants

- Industrial projects (2014-2019) amount to \$2,343,597 (PI) and \$200,000 (co-PI).
- NSF-DMS 1312391: *Collaborative Research: Mathematical Modeling of Biological Processes in Edematous Tissue*, 2013-2016, \$209,105; PI. NSF math bio proposal; PI
- NSF 1318348: *High Order in Time and Space Numerical Methods for Solving the Miscible Displacement Problem*, 2013-2016, \$229,830; PI.
- NSF 1160392: *2012 Finite Element Rodeo Conference*, \$2,000; PI.
- Texas Norman Hackerman Advanced Research Program Grant 003604-0015-2009: *Numerical Simulation of Carbon Dioxide Sequestration in Geologic Reservoirs*, \$149,000; 08/10-07/12; PI.
- NSF 0810422: *High order numerical methods for multiphysics couplings*, total cost \$341,912; 09/08-09/12; PI.

- NSF 0739261: *EMSW21-RTG: Complex Biological Systems Across Multiple Space and Time Scales*, total cost \$1,863,866; 06/08-05/12; original PI, coPIs are Ermentrout, Swigon, Yotov, new PI is Rubin.
- NSF 0506039: *Coupling complex flow and transport phenomena*, total cost \$150,000; 09/05-08/08; PI.
- DOE subcontract with New Mexico Tech: *Modeling of reactive transport through zeolite catalytic membrane*, total cost \$30,000; 08/05-07/06; PI.
- NIH 2P50 GM053789-09: Trauma Center Grant, Project V: Director of the math subaccount, 07/04-06/07, total cost \$131,224; PIs are Dr. T. R. Billiar, M.P. Fink, A.J. Bauer, B.R. Pitt, Y. Vodovotz, S.C. Watkins.
- AWM-NSF Mentoring Travel Grant, total cost \$3,270; 05/04-06/04.
- Central Research Development Fund, University of Pittsburgh, *Numerical simulations of multiphase processes in porous media*, total cost \$11,363, 07/03-06/05; PI.

Postdoctoral Fellows

- Jennifer Young, Postdoc mentor 2010-2012: Modeling of intestinal edema.
- Richard Rankin, Postdoc mentor 2012-2014: Simulation of black-oil.
- Florian Frank, Postdoc mentor 2014-present: Pore scale flow modeling.
- Travis Thompson, Postdoc mentor 2015-present: Modeling of intestinal edema.
- Nabil Chabaane, Postdoc mentor 2015-present: Coupled flow and geomechanics.

Ph.D. Graduate Students

- Christopher Thiele, CAAM, Ph.D. Thesis supervisor since 09/16.
- Bryan Doyle, CAAM, Ph.D. Thesis supervisor since 05/16.
- Maurice Fabien, CAAM, Ph.D. Thesis supervisor since 08/15.
- Chen Liu, CAAM, Ph.D. Thesis supervisor since 05/15.
- Emily Hendryx, CAAM, Ph.D. Thesis supervisor since 01/14.
- Charles Puelz, CAAM, Ph.D. Thesis supervisor since 09/13.
- Jizhou Li, CAAM, Ph.D. 2015. Thesis title: “High order discontinuous Galerkin methods for simulating miscible displacement process in porous media with a focus on minimal regularity”. Jizhou is the winner of the 2015 Ralph Budd Award for Research in Engineering. Jizhou is an employee of ExxonMobil.
- Yingpei Wang, CAAM, Ph.D. 2014. Thesis title: “On the approximation of the Dirichlet to Neumann map for high contrast two phase composites and its applications to domain decomposition methods”. Yingpei is an employee of Oracle.
- Xin Yang, CAAM, Ph.D. 2014. Thesis title: “Simulation of CO₂ sequestration in saline aquifers using discontinuous Galerkin method”. Xin is an employee of Oracle.
- Kun Liu, CAAM, Ph.D. 2013. Thesis title: “Discontinuous Galerkin Methods for Parabolic Partial Differential Equations with Random Input Data”. Kun is the Director of Business Development at Panton, Inc.
- Sevtap Ozisik, Middle East Technical University (METU), Ph.D. 2012. Thesis supervisor, jointly with S. Kaya. Thesis title: “Fully Computable Convergence Analysis of Discontinuous Galerkin Finite Element Approximation with an Arbitrary Number of Levels of Hanging Nodes”. Sevtap is an Assistant Professor in Turkey at Selcuk University.
- Aycil Cesmelioglu, CAAM, Ph.D. 2010. Thesis supervisor. Thesis title: “Complex Flow and Transport Phenomena in Porous Media”. Aycil is an Assistant Professor at Oakland University.

- Prince Chidyagwai, CAAM, Ph.D. 2010. Thesis supervisor. Thesis title: “Coupling Surface Flow with Porous Media Flow”. Prince is an Assistant Professor of Research at Temple University.
- Qi Mi, University of Pittsburgh, Ph.D. 2007. Thesis supervisor, jointly with D. Swigon. Thesis title: “Modeling The Wound Healing In Necrotizing Enterocolitis And Diabetic Foot Ulcer”. Qi is an Assistant Professor in the School of Health and Medicine at University of Pittsburgh.
- Yekaterina Epshteyn, University of Pittsburgh, Ph.D. 2007. Thesis supervisor. Thesis title: “HP Primal Discontinuous Galerkin Finite Element Methods For Two-Phase Flow In Porous Media”. Yekaterina is an Associate Professor in the department of Mathematics at University of Utah.
- Songul Kaya, University of Pittsburgh, Ph.D. 2004. Thesis supervisor jointly with W. Layton. Thesis title: “Numerical Analysis of a Variational Multiscale Method”. Winner of the 2004 Hales Distinguished Research Award for best doctoral dissertation. Songul is an Associate Professor at Middle East Technical University, Turkey.

Master Students

- Chen Liu, CAAM, M.A. 2016. Thesis title: “Pore-scale Simulation of Fluid Flow Using Discontinuous Galerkin Methods”.
- Rujeko Chinomona, CAAM, M.A. 2016. Thesis title: “Black Oil Simulation Utilizing a Central Finite Volume Scheme”.
- Brianna Lynn, CAAM, M.A. 2016. Thesis title: “Optimal Control of Flow and Transport Equations Using Discontinuous Galerkin Methods”.
- Emily Hendryx, CAAM, M.A. 2015. Thesis title: “Identifying ECG clusters in congenital heart disease”. Thesis co-supervisor, jointly with Craig Rusin. Emily continued in the Ph.D. program.
- Jun Tan, CAAM, M.A. 2013. Thesis title: “ Theoretical Convergence of Discontinuous Galerkin Methods for Poroelasticity Equations”.
- Jizhou Li, CAAM, M.A. 2013. Thesis title: “ Locally Mass-Conservative Method with Discontinuous Galerkin in Time for Solving Miscible Displacement Equations under Low regularity”. Jizhou continued in the Ph.D. program.
- Xin Yang, CAAM, M.A. 2012. Thesis title: “A Coupled Finite Volume and Discontinuous Galerkin Method for Convection-Diffusion Problems”. Xin continued in the Ph.D. program.
- Shirin Sardar, CAAM, M.A. 2012. Thesis title: “Penalty-Free Discontinuous Galerkin Methods for the Stokes and Navier-Stokes Equations”.
- Toni Tullius, CAAM, M.A. 2011. Thesis title: “Accelerated Discontinuous Galerkin Solvers with the Chebyshev Iterative Method on the Graphics Processing Unit”. Thesis co-supervisor, jointly with T. Warburton. Toni is currently a Ph.D. student in MEMS Department at Rice.
- Kun Liu, CAAM, M.A. 2010. Thesis title: “Discontinuous Galerkin Methods for Elliptic Partial Differential Equations with Random Coefficients”. Kun continued in the Ph.D. program.
- Christina Ho, CAAM, M.A. 2010. Thesis title: “Discontinuous Galerkin Formulation for Multi-component Multiphase Flow”. Christina is a reservoir engineering consultant at Haliburton.
- Ahmet Izmirliglu, University of Pittsburgh, M.S. 2008. Thesis title: “High Order Discontinuous Galerkin Methods for 1D Parabolic Equation”. Ahmet is a Ph.D. student at the University of Pittsburgh.
- Michael Chiacchiero, University of Pittsburgh, M.S. 2007. Thesis title: “Efficient PETSc Solvers for Discontinuous Galerkin Methods Applied to Elliptic Problems”. Michael is a Professor of Mathematics at Edison State College.

Undergraduate Students

- James Phillip, Summer 2016.
- James Lee, CAAM, Summer 2015, Summer and Fall 2016.

- Justin Dong, Chemical Engineering, Spring 2013, Fall 2013, Spring 2014. His research results appeared in a paper of SIAM Undergraduate Research Online (SIURO, vol. 7) and in a paper in Computational Geosciences.
- Yichen Lu, Chemical Engineering, Summer and Fall 2011, Spring 2012.
- Joey Huchette, CAAM, Spring and Summer 2011. His research results appeared in a paper of SIAM Undergraduate Research Online (SIURO, vol. 5).
- John Vogelgesang, CAAM, Spring 2011.
- David Medina, AGEP participant, Summer 2011.
- Yuekai Sun, CAAM, Summer and Fall 2009.
- Shantay Branton, AGEP participant, Summer 2009.
- William Klieber, University of Pittsburgh, Bachelor of Philosophy, Honors College, 2007. Thesis title: “Numerical Simulations of Two-Phase Flow”.

Education

Doctor of Philosophy, Computational and Applied Mathematics, May 2000

The University of Texas at Austin, Austin, TX.

Specialization: Finite Element Methods for Surface and Subsurface Flows.

Dissertation: “Discontinuous Galerkin Methods for Solving the Miscible Displacement Problem in Porous Media”, advisor Dr. M.F. Wheeler.

Master of Science, Mathematics, May 1996

The Pennsylvania State University, University Park, PA.

Specialization: Algebraic Topology, advisor Dr. N. Higson.

Diplome d’Ingénieur, July 1995

Ecole Centrale de Lyon, Lyon, France.

Specialization: Mathematics applied to computing and modeling.

Licence de Mathématiques, June 1993

Claude-Bernard University, Lyon, France.

Book

B. Rivière, Discontinuous Galerkin Methods for Solving Elliptic and Parabolic Equations: Theory and Implementation, SIAM 2008, ISBN-10:089871656X.

Refereed Journal Publications

1. N. Chaabane, V. Girault, C. Puelz, **B. Rivière**. “Convergence of IPDG for coupled time dependent Navier-Stokes and Darcy equations”, submitted.
2. V. Girault, J. Li, **B. Rivière**. “Strong Convergence of Discrete DG Solutions of the Heat Equation”, Journal of Numerical Mathematics, to appear.
3. O. Alpak, F. Frank, **B. Rivière**. “A phase-field method for the direct simulation of two-phase flows in pore-scale media using a non-equilibrium wetting boundary condition”, Computational Geosciences, to appear.
4. J. Dong, **B. Rivière**. “A Semi-Implicit Method for Incompressible Three-Phase Flow in Porous Media”, Computational Geosciences, 20 (6), p. 1169-1184, 2016.
5. J. Li, **B. Rivière**. “Numerical Modeling of Miscible Viscous Fingering Instabilities by High Order Methods”, Transport in Porous Media, 113 (3), p. 607-628, 2016.
6. J. Li, **B. Rivière**. “High Order Discontinuous Galerkin Method for Simulating Miscible Flooding in Porous Media”, Computational Geosciences, 19 (6), p. 1251-1268, 2015, DOI:10.1007/s10596-015-9541-4.
7. J. Li, **B. Rivière** and N. Walkington. “Convergence of a High Order Method in Time and Space for the Miscible Displacement Equations”, ESAIM: Mathematical Modelling and Numerical Analysis, 49, p. 953-976, 2015.

8. J. Li and **B. Rivière**. "Numerical Solutions of the Incompressible Miscible Displacement Equations in Heterogeneous Media", *Computer Methods in Applied Mechanics and Engineering*, 292, p. 107–121, DOI:10.1016/j.cma.2014.10.048, 2015.
9. S. Acosta, C. Puelz, **B. Rivière**, D. Penny, C. Rusin. "Numerical Method of Characteristics for One-Dimensional Blood Flow", *Journal of Computational Physics*, 294, p. 96-109, 2015.
10. R. Rankin, **B. Rivière**. "A High Order Method for Solving the Black-Oil Problem in Porous Media", *Advances in Water Resources*, 78, p.126–144, 2015.
11. J. Young, S. Ozisik, **B. Rivière**, M. Shamim. "A Comprehensive Mathematical Framework for Modeling Intestinal Smooth Muscle Cell Contraction with Applications to Intestinal Edema", *Mathematical Biosciences*, 262, p.206–213, 2015.
12. **B. Rivière** and X. Yang. "Convergence Analysis Of A Coupled Method for Time-Dependent Convection-Diffusion Equations", *Numerical Methods for Partial Differential Equations*, 30 (1), p. 133-157, 2014.
13. K. Liu and **B. Rivière**. "Discontinuous Galerkin Methods for Elliptic Partial Differential Equations with Random Coefficients", *International Journal of Computer Mathematics*, 90 (11), p. 2477-2490, 2013.
14. **B. Rivière** and S. Sardar. Penalty-Free Discontinuous Galerkin For Incompressible Navier-Stokes Equations, *Mathematical Models and Methods in Applied Sciences (M3AS)*, 24 (6) p.1217–1236, 2014.
15. V. Girault, G. Kanschat and **B. Rivière**. "Error analysis for a monolithic discretization of coupled Darcy and Stokes problems", *Journal of Numerical Mathematics*, 22, p.109–142, 2014, also IMA preprint 2390.
16. **B. Rivière**. Discontinuous Finite Element Methods for Coupled Surface-Subsurface Flow and Transport Problems, *IMA Volumes in Mathematics and its Applications: Recent Developments in Discontinuous Galerkin Finite Element Methods for Partial Differential Equations*, Springer, p. 259-279, 2013.
17. D. E. Keyes, L. C. McInnes, C. Woodward, W. D. Gropp, E. Myra, M. Pernice, J. Bell, J. Brown, A. Clo, J. Connors, E. Constantinescu, D. Estep, K. Evans, C. Farhat, A. Hakim, G. Hammond, G. Hansen, J. Hill, T. Isaac, X. Jiao, K. Jordan, D. Kaushik, E. Kaxiras, A. Koniges, K. Lee, A. Lott, Q. Lu, J. Magerlein, R. Maxwell, M. McCourt, M. Mehl, R. Pawlowski, A.P. Randles, D. Reynolds, **B. Rivière**, U. Rüde, T. Scheibe, J. Shadid, B. Sheehan, M. Shephard, A. Siegel, B. Smith, X. Tang, C. Wilson, and B. Wohlmuth. Multiphysics Simulations: Challenges and Opportunities, special issue of *International Journal of High Performance Computing Applications*, 27 (1), p.4 -83, 2013.
18. J. Young, **B. Rivière**, K. Uray, and C. Cox. A Mathematical Model of Intestinal Edema Formation, *Mathematical Medicine and Biology*, to appear, 2012.
19. A. Cesmelioglu, V. Girault, and **B. Rivière**. Time-Dependent Coupling of Navier-Stokes and Darcy Flows, *ESAIM: Mathematical Modelling and Numerical Analysis*, to appear, 2012.
20. A. Cesmelioglu and **B. Rivière**. Existence Of A Weak Solution For The Fully Coupled Navier-Stokes/Darcy-Transport Problem, *Journal of Differential Equations*, 252 (7), p. 4138-4175, 2012.
21. P. Chidyagwai and **B. Rivière**. A Two-grid Method For Coupled Free Flow With Porous Media Flow, *Advances in Water Resources*, 34, p.1113-1123, 2011.
22. **B. Rivière** and N. Walkington. Convergence Of A Discontinuous Galerkin Method For The Miscible Displacement Under Low Regularity, *SIAM Journal on Numerical Analysis*, 49, p.1085-1110, 2011.
23. P. Chidyagwai, I. Mishev and **B. Rivière**. On The Coupling Of Finite Volume And Discontinuous Galerkin Method For Elliptic Problems, *Journal of Computational and Applied Mathematics*, 231 p.2193-2204, 2011, doi:10.1016/j.cam.2010.10.017, also technical report TR10-10.
24. T. Wihler and **B. Rivière**, Discontinuous Galerkin Methods For Second-Order Elliptic PDE With Low-Regularity Solutions, *Journal of Scientific Computing*, 46 (2), p. 151-165, 2011.

25. G. Kanschat and **B. Rivière**, A Strongly Conservative Finite Element Method For The Coupling Of Stokes And Darcy flow, *Journal of Computational Physics*, 229, p.5933-5943, doi 10.1016/j.jcp.2010.04.021, 2010
26. P. Chidyagwai and **B. Rivière**, Numerical Modelling of Coupled Surface and Subsurface Flow Systems, *Advances in Water Resources*, 33, p.92-105, 2010.
27. P. Chidyagwai and **B. Rivière**, On the Solution of the Coupled Navier-Stokes and Darcy Equations, *Computer Methods in Applied Mechanics and Engineering*, 198, p. 3806-3820, 2009.
28. J. Proft and **B. Rivière**, Discontinuous Galerkin Methods for Convection-Diffusion Equations with Varying and Vanishing Diffusivity, *International Journal of Numerical Analysis and Modeling*, 6 (4), p.533-561, 2009.
29. J. Guzman and **B. Rivière**, Sub-Optimal Convergence of Non-Symmetric Discontinuous Galerkin Methods for Odd Polynomial Approximations, *J. Scient. Comp.*, 40, p. 273-280, 2009
30. A. Cesmelioglu and **B. Rivière**, Primal Discontinuous Galerkin Methods For Time-Dependent Coupled Surface And Subsurface Flow, *J. Scient. Comp.*, 40, p.115-140, 2009
31. **B. Rivière**, Y. Epshteyn, D. Swigon and Y. Vodovotz, A Simple Mathematical Model of Signaling Resulting from the Binding of Lipopolike Receptor 4 Demonstrates Inherent Preconditioning Behavior, *Mathematical Biosciences*, 217 (1) p. 19-26, 2009
32. A. Cesmelioglu and **B. Rivière**, Analysis of Time-Dependent Navier-Stokes Flow Coupled with Darcy Flow, *J. Numer. Math.*, 16 (4) p. 249-280, 2008
33. V. Girault, **B. Rivière**, DG Approximation of Coupled Navier-Stokes and Darcy Equations by Beaver-Joseph-Saffman Interface Condition, *SIAM Journal on Numerical Analysis*, 47, p. 2052-2089, 2009.
34. Y. Epshteyn, T. Khan and **B. Rivière**, Numerical Solution of a One-Dimensional Inverse Problem by the Discontinuous Galerkin Method, *Mathematics and Computers in Simulation*, 79 p. 1989-2000, 2009.
35. Y. Epshteyn, **B. Rivière**, Analysis of hp Discontinuous Galerkin Methods for Incompressible Two-Phase Flow, *Journal of Computational and Applied Mathematics*, 225 p. 487-509, 2009.
36. Y. Epshteyn, **B. Rivière**, Convergence of High Order Methods for Miscible Displacement, *International Journal of Numerical Analysis and Modeling*, 5 p.47-63, 2008.
37. Q. Mi, D. Swigon, **B. Rivière**, S. Cetin, Y. Vodovotz, D. Hackam, One-Dimensional Elastic Continuum Model of Enterocyte Layer Migration, *Biophysical Journal*, 93 p.3745-3752, 2007.
38. Q. Mi, **B. Rivière**, G. Clermont, D.L. Steed, Y. Vodovotz, Agent-Based Modeling of Inflammation and Wound Healing: Insights into Diabetic Foot Ulcer Pathology and the Role of Transforming Growth Factor- β 1, *Wound Repair and Regeneration*, 15 (5), p.671-682, 2007.
39. **B. Rivière**, S. Shaw and J.R. Whiteman, Discontinuous Galerkin Finite Element Methods for Dynamic Linear Solid Viscoelasticity Problems, *Numerical Methods for Partial Differential Equations*, 23 (5) p.1149-1166, 2007.
40. Y. Epshteyn and **B. Rivière**, Estimation of Penalty Parameters for Symmetric Interior Penalty Galerkin Methods, *Journal of Computational and Applied Mathematics*, 206 p.843-872, 2007.
41. **B. Rivière** and S. Shaw, Discontinuous Galerkin Finite Element Approximation of Nonlinear Non-Fickian Diffusion in Viscoelastic Polymers, *SIAM Journal on Numerical Analysis*, 44 (6) p.2650-2670, 2006, also technical report BICOM 05/06.
42. S. Kaya, W. Layton and **B. Rivière**, Subgrid Stabilized Defect Correction Methods for the Navier-Stokes Equations, *SIAM Journal on Numerical Analysis*, 44 (4) p.1639-1654, 2006.
43. Y. Epshteyn and **B. Rivière**, Fully Implicit Discontinuous Finite Element Methods for Two-Phase Flow, *Applied Numerical Mathematics*, 57 (4) p.383-401, 2007.
44. W. Klieber and **B. Rivière**, Adaptive Simulations of Two-Phase Flow by Discontinuous Galerkin Methods, *Computer Methods in Applied Mechanics and Engineering*, 196 p.404-419, 2006.

45. Y. Epshteyn and **B. Rivière**, On the Solution of Incompressible Two-Phase Flow by a p-Version Discontinuous Galerkin Method, *Communications in Numerical Methods in Engineering*, 22 p.741-751, 2006.
46. **B. Rivière** and V. Girault, Discontinuous Finite Element Methods for Incompressible Flows on Subdomains with Non-Matching Interfaces, *Computer Methods in Applied Mechanics and Engineering*, 195 p.3274-3292, 2006.
47. S. Kaya and **B. Rivière**, A Two-Grid Stabilization Method for Solving the Steady-state Navier-Stokes Equations, *Numerical Methods for Partial Differential Equations*, 22 (3) p.728-743, 2006, also TR-MATH 04-06.
48. V. Girault, **B. Rivière** and M.F. Wheeler, A Splitting Method Using Discontinuous Galerkin for the Transient Incompressible Navier-Stokes Equations, *Mathematical Modelling and Numerical Analysis (M2AN)* (previously RAIRO), 39 (6) p.1115-1148, 2005, also TR-MATH 04-08.
49. S. Kaya and **B. Rivière**, A Discontinuous Subgrid Eddy Viscosity Method for the Time Dependent Navier-Stokes Equations, *SIAM Journal on Numerical Analysis*, 43 (4) p.1572-1595, 2005, also TR-MATH 03-18.
50. **B. Rivière**, Analysis of a Discontinuous Finite Element Method for the Coupled Stokes and Darcy Problems, *Journal of Scientific Computing*, 22 (1) p.479-500, 2005.
51. **B. Rivière** and I. Yotov, Locally Conservative Coupling of Stokes and Darcy Flows, *SIAM Journal on Numerical Analysis*, 42 (5) p.1959-1977, 2005, also TR-MATH 03-08.
52. V. Girault, **B. Rivière** and M.F. Wheeler, A Discontinuous Galerkin Method with Non-Overlapping Domain Decomposition for the Stokes and Navier-Stokes Problems, *Mathematics of Computation*, 74 p.53-84, 2005.
53. **B. Rivière**, Analysis of a Multi-Numerics/Multi-Physics Problem, *Numerical Mathematics and Advanced Applications, ENUMATH 2003*, ed. Feistauer, Dolejsi, Knobloch and Najzar, p.726-735, Springer-Verlag 2004.
54. **B. Rivière**, S. Shaw, M.F. Wheeler and J.R. Whiteman, Discontinuous Galerkin Finite Element Methods for Linear Elasticity and Quasistatic Linear Viscoelasticity, *Numerische Mathematik*, 95 (2) p.347-376, 2003.
55. P. Bastian and **R. Rivière**, Superconvergence and H(div) Projection for Discontinuous Galerkin Methods, *International Journal for Numerical Methods in Fluids*, 42 (10) p.1043-1057, 2003.
56. **B. Rivière** and M.F. Wheeler, Discontinuous Finite Element Methods for Acoustic and Elastic Wave Problems, *Contemporary Mathematics*, 329 p.271-282, 2003.
57. **B. Rivière** and M.F. Wheeler, A Posteriori Error Estimates for a Discontinuous Galerkin Method Applied to Elliptic Problems. Log number: R74, *Computers and Mathematics with Applications*, 46 (1) p.141-164, 2003.
58. **B. Rivière** and M.F. Wheeler, Non Conforming Methods for Transport with Nonlinear Reaction, *Contemporary Mathematics*, 95 p.421-432, 2002.
59. S. Sun, **B. Rivière** and M.F. Wheeler, A Combined Mixed Finite Element and Discontinuous Galerkin Method for Miscible Displacement Problem in Porous Media, *Recent Progress in Computational and Applied PDEs*, Kluwer Academic/Plenum Publishers, p.321-348, 2002.
60. E. Jenkins, **B. Rivière** and M.F. Wheeler, A Priori Error Estimates for Mixed Finite Element Approximations of the Acoustic Wave Equation, *SIAM Journal on Numerical Analysis*, 40 (5) p.1698-1715, 2002.
61. **B. Rivière** and M.F. Wheeler, Coupling Locally Conservative Methods for Single Phase Flow, *Computational Geosciences*, 6 (3) p.269-284, 2002.
62. **B. Rivière** and M.F. Wheeler, Discontinuous Galerkin Methods for Flow and Transport Problems in Porous Media, *Communications in Numerical Methods in Engineering*, 18 (1) p.63-68, 2002.

63. **B. Rivière**, M.F. Wheeler and V. Girault, *A Priori* Error Estimates for Finite Element Methods Based on Discontinuous Approximation Spaces for Elliptic Problems, *SIAM Journal on Numerical Analysis*, 39 (3) p.902-931, 2001.
64. **B. Rivière**, M.F. Wheeler and K. Banas, Part II. Discontinuous Galerkin Method Applied to a Single Phase Flow in Porous Media, *Computational Geosciences* 4 p.337-349, 2000.
65. **B. Rivière**, M.F. Wheeler, Locally Conservative Algorithms for Flow, *The Mathematics of Finite Elements and Applications X (MAFELAP 1999)* ed. J. Whiteman, p.29-46, 2000, Elsevier.
66. **B. Rivière**, M.F. Wheeler and V. Girault, Improved Energy Estimates for Interior Penalty, Constrained and Discontinuous Galerkin Methods for Elliptic Problems. Part I., *Computational Geosciences* 3 p.337-360, 1999.
67. **B. Rivière**, M.F. Wheeler, A Discontinuous Galerkin Method Applied to Nonlinear Parabolic Equations, *Discontinuous Galerkin Methods: Theory, Computation and Applications*, ed. B. Cockburn, G.E. Karniadakis and C.-W. Shu, p.231-244, 1999.
68. G. Baker, J. Gunnels, G. Morrow, **B. Rivière**, R. van de Geijn, PLAPACK: High Performance through High-Level Abstraction, icpp, p. 414, 1998 International Conference on Parallel Processing (ICPP'98), 1998.

Non-refereed Publications

1. F. Frank, C. Liu, F. Alpak, M. Araya-Polo and **B. Rivière**. A Discontinuous Galerkin Finite Element Framework for the Direct Numerical Simulation of Flow on High-Resolution Pore-Scale Images. Proceedings of the Society for Petroleum Engineers conference, SPE-182606-MS, 2017.
2. C. Thiele, M. Araya-Polo, F. Alpak, **B. Rivière** and F. Frank. Inexact Hierarchical Scale Separation: An Efficient Linear Solver for Discontinuous Galerkin Discretizations. Proceedings of the Society for Petroleum Engineers conference, SPE-182671-MS, 2017.
3. G. Kanschat, V. Girault and **B. Rivière**. Error Analysis For A Monolithic Discretization Of Coupled Darcy And Stokes Problems, Oberwolfach Report, 2014.
4. V. Girault, G. Kanschat and **B. Rivière**. On the Coupling of Incompressible Stokes or Navier-Stokes and Darcy Flows through Porous Media. Proceedings of Workshop on Fluid Dynamic in Porous Media 2011, 2012.
5. J. Young and **B. Rivière**. The Development of a Computational, Poroelastic Model of Intestinal Edema. Proceedings of the ECCOMAS Thematic International Conference on Simulation and Modeling of Biological Flows, 2011.
6. **B. Rivière**, P. Chidyagwai, I. Mishev, On the Coupling of Finite Volume and Discontinuous Galerkin for Reservoir Simulation Problems. Proceedings of the Society for Petroleum Engineers conference, 2011.
7. A. Cesmelioglu and **B. Rivière**. Mathematical Analysis of a Multiphysics Problem. Technical report TR10-23, 2010.
8. Y. Epshteyn, **B. Rivière**, D. Swigon and Y. Vodovotz, A Simple Mathematical Model of Lipopolysaccharide Signaling through Toll-Like Receptor 4 Results in Complex Insights on Preconditioning, *Journal of Critical Care*, 22 (4), p.333-335, 2007.
9. Q. Mi, D. Swigon and **B. Rivière**, Two-Dimensional Elastic Continuum Model of Enterocyte Layer Migration, *Journal of Critical Care*, 22 (4), p.350, 2007.
10. Y. Epshteyn and **B. Rivière**, Fully Implicit Discontinuous Galerkin Scheme for Two-Phase Flow, *Proceedings of the MSRI workshop "The Legacy of Ladyzhenskaya and Oleinik"*, p.125-128, 2006.
11. Y. Vodovotz, C. Chow, J. Bartels, C. Lagoa, R. Kumar, J. Day, J. Rubin, B. Ermentrout, **B. Rivière**, I. Yotov, G. Constantine, T. Billiar, M. Fink and G. Clermont, Mathematical Simulations of Sepsis and Trauma, *Proceedings of the 11th Congress of the European Shock Society*, p.151-159, 2005.
12. **B. Rivière**, Numerical Study of a Discontinuous Galerkin Method for Incompressible Two-Phase Flow, *ECCOMAS 2004 Proceedings*, 2004, available on CD-ROM.

13. M.F. Wheeler, M. Peszynska and **B. Rivière**, Computational Science Issues in Modeling Oil and Gas Production, *Proceedings of the 8th European Conference on the Mathematics of Oil Recovery-ECMOR VIII*, publisher EAGE, 2002.
14. **B. Rivière**, M.F. Wheeler, Miscible Displacement in Porous Media, *Proceedings of the XIV International Conference on Computational Methods in Water Resources*, ed. S.M. Hass Aniz Adeg and R.J. Schotting, Developments in Water Science, 47 p.907-914, 2002.
15. M. Guillot, **B. Rivière**, M.F. Wheeler, Discontinuous Galerkin Methods for Mass Conservation Equations for Environmental Modeling, *Proceedings of the XIV International Conference on Computational Methods in Water Resources*, ed. S.M. Hass Aniz Adeg and R.J. Schotting, Developments in Water Science, 47 p.939-946, 2002.
16. M. Wheeler, O. Eslinger, S. Sun and **B. Rivière**, Discontinuous Galerkin Method for Modeling Flow and Reactive Transport in Porous Media, *Proceedings of 2002 CANUM conference*, series ESAIM, 2002.
17. **B. Rivière**, M.F. Wheeler, E. Jenkins, Locally Conservative Algorithms for Flow, *Proceedings of the Department of Defense Users Group Meeting*, 2001, available on CD-ROM.
18. C.N. Dawson, **B. Rivière**, M.F. Wheeler, Discontinuous Galerkin Methods for Flow and Reactive Transport, *Proceedings of the Department of Defense Users Group Meeting*, Albuquerque, N.M., June 5-8 2000, available on CD-ROM.

Reviews

1. **B. Rivière**, book review of *Computational Methods for Multiphase Flows in Porous Media*, by Z. Chen, G. Huan and Y. Ma., in *Mathematics of Computation*, 76 (260), p.2253-2255, 2007.

Newspaper Articles

1. **B. Rivière**, E. Jenkins, In Pursuit of Better Models and Simulations, Oil Industry Looks to the Math Sciences, *SIAM News*, 35 (1), January-February 2002.
2. E. Jenkins, **B. Rivière**, Geoscientists Meet in Colorado to Explore Increasingly Complex, Multidisciplinary Problems, *SIAM News*, 24 (9), November 2001.

Other Selected Publications

1. Mathematics of Planet Earth blog, 2013.
2. P. Bastian and **B. Rivière**, Discontinuous Galerkin Methods for Two-phase Flow in Porous Media, University of Heidelberg, Technical Report 2004-28, 2004.
3. **B. Rivière**, Mathematics and the Energy Crisis, *Pitt MathZine*, electronic magazine (www.math.pitt.edu/magazine.html), 2002.
4. **B. Rivière**, The DGIMPES Model in IPARS: Discontinuous Galerkin for Two-Phase Flow Integrated in a Reservoir Simulator Framework, *Texas Institute for Computational and Applied Mathematics Report 02-29*, 2002.
5. **B. Rivière**, M.F. Wheeler, Optimal Error Estimates for Discontinuous Galerkin Methods Applied to Linear Elasticity Problems, *Texas Institute for Computational and Applied Mathematics Report 00-30*, 2000.
6. **B. Rivière**, K. Banas, M.F. Wheeler, hp 3D Flow Simulations of Discontinuous Galerkin Finite Element Methods, *Texas Institute for Computational and Applied Mathematics Report 00-29*, 2000.
7. **B. Rivière**, A Classification of the Riemannian Surfaces, The Pennsylvania State University, *Department of Mathematics Report*, 1996.

Invited Talks

University/Industry Seminars and Colloquia

1. Flexible and Scalable Discretizations for Porous Media Applications, Total, Houston (10/16).

2. Simulation of Viscous Fingering with High Order Numerical Methods, IFPEN, Paris (06/16).
3. Discontinuous Galerkin Method for Miscible Displacement Simulations, Shell, Houston (04/15).
4. Convergence of a High Order Method in Space and in Time for the Miscible Displacement Problem, University of Texas at Austin, Austin (10/14).
5. Flexible Numerical Methods for Porous Media Flows, University of Heidelberg, Germany (06/14).
6. Flexible Numerical Methods for Reservoir Flows, Institut Francais du Petrole, Paris (05/14).
7. Numerical Methods For Flows In Heterogeneous Porous Media, University Pierre et Marie Curie, Paris (05/14).
8. High Order Flexible Methods for Processes in Porous Media, Geophysical Society of Houstons Data Processing and Acquisition seminar, (11/13).
9. Flexible Discontinuous Galerkin Methods for Complex Flows, Shell Company, (07/13).
10. Locally Mass Conservative Methods for Flows in Porous Media, Exxon Mobil Upstream Research Company, (05/13).
11. Multiphysics and Multinumerics Couplings, Ken Kennedy Institute for Information Technology Member Luncheon Talk, Rice University, (11/10).
12. Weak Solution and Numerical Solution of Multiphysics Couplings, Department of Mathematics, University of Houston, (02/10).
13. Multiphysics couplings in porous media, Department of Mathematical Sciences, Carnegie Mellon University, (09/09).
14. Applications of Discontinuous Galerkin Methods to Complex Flow and Transport Problems, Exxon Mobil Upstream Research Company, (02/09).
15. Multiphysics couplings in porous media, Department of Mathematics, University of Houston, (10/08).
16. Application of Discontinuous Galerkin Methods for Complex Flow and Transport, Department of Civil & Environmental Engineering, University of Pittsburgh, (12/07).
17. On the Modeling and Simulation of Porous Media Problems, Department of Mechanical Engineering and Material Sciences, University of Pittsburgh, (10/07).
18. On Coupled Flow and Two-Phase Flow Problems, Department of Mathematics & Statistics, McGill University, (09/07).
19. Analysis and Simulation of Complex Flow Processes, Rice University, (03/07).
20. Coupling Incompressible Flow With Porous Media Flow, Department of Mathematics, University of Pittsburgh, (09/06).
21. Complex Flow Processes with Applications in Porous Media, University of Pittsburgh, (09/06).
22. High-Order Discontinuous Finite Element Methods for Incompressible Flows, Oregon State University, (05/06).
23. Modeling Complex Flow and Transport Processes, Oregon State University, (05/06).
24. On the Solution of Complex Flow and Transport Processes, University of Maryland at College Park, (02/06).
25. On the Choice of Numerical Fluxes for Discontinuous Galerkin Methods for Coupled Parabolic-Hyperbolic Regions, Computational Mathematics Seminar, University of Pittsburgh, (10/05).
26. Discontinuous Galerkin for Incompressible Flows, Louisiana State University, (03/05).
27. An Operator Splitting Technique for Solving the Navier-Stokes Equations, Computational Mathematics Seminar, University of Pittsburgh, (10/04).
28. Discontinuous Galerkin Methods for Surface and Subsurface Flows, Université Paris XI, Orsay, France (05/04).

29. A Multiphysics-Multinumerics Approach for Surface and Subsurface Flow, Computational Mathematics Seminar, University of Pittsburgh, (09/03).
30. Analysis of Discontinuous Galerkin Methods for Stokes and Navier-Stokes Equations, Department of Mathematical Sciences, Clemson University, (04/03).
31. A Posteriori Error Estimation for Discontinuous Galerkin Methods, Computational Mathematics Seminar, University of Pittsburgh, (03/03).
32. Discontinuous Galerkin Methods for Porous Media Applications, Mechanical Engineering Seminar Series, University of Pittsburgh, (01/03).
33. Discontinuous Galerkin Methods for Stokes and Navier-Stokes, Computational Mathematics Seminar, University of Pittsburgh, (10/02).
34. Introduction to Discontinuous Galerkin Methods for Elliptic Problems, Computational Mathematics Seminar, University of Pittsburgh, (09/02).
35. Fully Discontinuous Approximations of Stokes and Navier-Stokes problems, Interdisziplinäres Zentrum für Wissenschaftliches Rechnen, University of Heidelberg, Germany (06/02).
36. Discontinuous Galerkin Methods for Solving Flow and Transport Problems, Texas Tech University (02/02).
37. Discontinuous Galerkin Methods for Solving Flow and Transport Problems, University of Washington (02/02).
38. Discontinuous Galerkin Methods for Solving Flow and Transport Problems, University of Delaware (02/02).
39. Discontinuous Galerkin Methods for Solving Flow and Transport Problems, Worcester Polytechnic Institute (02/02).
40. An Introduction to Finite Element Methods, Worcester Polytechnic Institute (02/02).
41. Discontinuous Galerkin Methods for Solving Flow and Transport Problems, University of California at Davis (01/02).
42. Discontinuous Finite Element Methods for Transport and Two-phase Flow Problems, The University of Pittsburgh (01/02).
43. Discontinuous Methods for Modeling Subsurface Phenomena, Clemson University (01/02).
44. Discontinuous Galerkin Methods for Solving Flow and Transport Problems, Oklahoma State University (01/02).
45. Discontinuous Galerkin Applications to Multinumerics and Multiphase Flow, The University of Texas at Austin (11/01).
46. Locally Conservative Methods for Flow in Porous Media, The University of Pittsburgh, Pittsburgh (09/01).
47. Méthodes des Eléments Finis Discontinus pour la Simulation des Ecoulements dans les Milieux Poreux, Université Paris XI, Orsay, France (03/01).
48. Locally Conservative Methods for Subsurface Flow, Interdisziplinäres Zentrum für Wissenschaftliches Rechnen, University of Heidelberg, Germany (03/01).
49. Méthodes des Eléments Finis Discontinus pour les Ecoulements dans les Milieux Poreux, INRIA-Rocquencourt, France (02/01).
50. Transport Schemes for Subsurface Flow Simulators, Audition de la Commission National d'Evaluation des Recherches pour la Gestion des Dechets Radioactifs, Maison de la Chimie, Paris, France (02/01).
51. Transport Schemes for Multicomponent, Multiphase Reactive Flow, ANDRA (French National Agency for Radioactive Waste Management), Châtenay-Malabry, France (02/01).

1. Numerical Modeling of Viscous Fingering, *Geo-Mathematical Imaging 2016* workshop, Rice, (04/16).
2. Numerical Methods for Reduced Blood Flow Models, *Finite Element Rodeo*, Texas A& M University, (03/16).
3. Hybrid Parallel Implementation of the DG Method, *Oil and Gas HPC conference*, Rice, (03/16).
4. Numerical Simulations of the Cahn-Hilliard Equation in Porous Domains, *SIAM Geosciences 2015*, Stanford, (06/15).
5. High Order Discretization for Simulating Miscible Displacement Process in Porous Media, *SIAM Geosciences 2015*, Stanford, (06/15).
6. High Order Methods for Flows in Heterogeneous Porous Media, *Advanced Numerical Methods in the Mathematical Sciences*, Texas A& M University, College Station, (05/15). (Invited Speaker)
7. Strongly Scalable High Order Algorithm for Miscible Flooding on Massively Parallel Architecture, *Oil and Gas HPC workshop*, Rice University, (03/15).
8. Scalable High Order Methods for Miscible Flooding, *Finite Element Rodeo*, Southern Methodist University, Dallas, (02/15).
9. Numerical Algorithms for Coupled Free and Porous Medium Flows, *Workshop on Coupling of Free and Porous Medium Flow*, Stuttgart, (03/14).
10. High order methods for reservoir flows, *2014 Rice Oil & Gas HPC Workshop*, Houston (03/14).
11. High Order Methods for Coupled Flow and Transport Problems, *12th U.S. National Congress on Computational Mechanics*, Raleigh (07/13). (Keynote Speaker)
12. Numerical solution of miscible displacement under low regularity, *SIAM Annual Meeting*, San Diego (07/13). (Invited Talk in Minisymposium)
13. Locally Mass Conservative Methods with Discontinuous Galerkin in Time for Miscible Displacement in Porous Media, *SIAM Conference on Mathematical and Computational Issues in the Geosciences*, Padova, Italy (06/13). (Invited Talk in Minisymposium)
14. Convergence of High Order Methods for the Miscible Displacement Problem, *The Mathematics of Finite Elements and Applications 2013 (MAFELAP)*, Brunel University, England (06/13). (Invited Talk in Minisymposium)
15. A Poroelasticity Model for Intestinal Edema, *Finite Element Rodeo and Circus*, Baton Rouge (03/13).
16. Discontinuous Galerkin Methods for Multiphysics Problems, *20th International Conference on Domain Decomposition Methods*, Rennes, France (06/12). (Plenary Speaker)
17. Coupled Free Flows and Porous Media Flows, *2012 John H. Barrett Memorial Lectures Conference*, (05/12). (Invited Speaker)
18. A splitting strategy for the coupled surface and subsurface flow problem, *Workshop on Splitting and Multiscale Methods for Computational PDEs*, Baylor University, Waco, (09/11).
19. Coupling locally mass conservative methods for flow in porous media, *Workshop on Advances in Numerical Analysis & Scientific Computing*, University of Houston, Houston, (04/11). (Plenary Speaker)
20. *Workshop on Analytical and numerical methods for multi-scale systems*, Univ. Heidelberg, (02/11). (Plenary Speaker)
21. On the Coupling of Finite Volume and Discontinuous Galerkin for Reservoir Simulation Problems, *2011 SPE Reservoir Simulation Symposium*, Woodlands, (02/11).
22. Multi-numeric methods for porous media flows, *Scientific Computing Around Louisiana Conference*, Tulane University, New Orleans, (01/11). (Invited Speaker)
23. Weak And Numerical Solutions For Coupled Navier-Stokes, Darcy And Transport Equations, *Joint Mathematics Meetings Conference*, New Orleans (01/11). (Invited Talk in Minisymposium)
24. On the coupled problem of Navier-Stokes, Darcy and transport problems, *SIAM Conference on Analysis of Partial Differential Equations*, Miami (12/09). (Invited Talk in Minisymposium)

25. Numerical Methods for Solving the Miscible Displacement Problem, *1051st AMS Meeting*, Baylor University (10/09). (Invited Talk in Minisymposium)
26. Computational and Applied Mathematics, *Mathematics Leadership Institute, Summer 2009*, Houston (06/09). (Invited Speaker)
27. A Multinumerics Method for Solving a Multiphysics Problem, *The Mathematics of Finite Elements and Applications 2009 (MAFELAP)*, Brunel University, England (06/09). (Invited Talk in Minisymposium)
28. A Weak Solution and A Numerical Solution of the Coupled Navier-Stokes and Darcy Equations, *SIAM Conference on Mathematical and Computational Issues in the Geosciences*, Leipzig Germany (06/09). (Invited Talk in Minisymposium)
29. Numerical Solution of the Transport of Contaminants in Surface and Subsurface Flows, *SIAM Conference on Mathematical and Computational Issues in the Geosciences*, Leipzig Germany (06/09). (Invited Talk in Minisymposium)
30. On the Modeling of Cell Migration in NEC, *SIAM Life Sciences*, Montreal (08/08). (Invited Talk in Minisymposium)
31. On the Coupling of Incompressible Flow with Darcy Flow, *9th United States National Congress on Computational Mechanics*, San Francisco (07/07). (Invited Talk in Minisymposium)
32. A Weak Solution and A Discrete Solution Of The Coupled Darcy Navier-Stokes Problem, *Finite Element Circus*, University of Maryland at College Park (04/07).
33. Adaptive and Implicit High Order Methods for Two-Phase Flow, *SIAM Annual 2006*, Boston (07/06). (Invited Talk in Minisymposium)
34. Application of Interior Penalty Galerkin Method to Inverse Problem, *SIAM Annual 2006*, Boston (07/06). (Invited Talk in Minisymposium)
35. Improved Discontinuous Galerkin Methods for Transport Equations with Varying Diffusivity, *The Mathematics of Finite Elements and Applications 2006 (MAFELAP)*, Brunel University, England (06/06). (Invited Talk in Minisymposium)
36. Finite Element Methods for an Inverse Problem, *Finite Element Circus*, University of Maryland at Baltimore County (03/06).
37. On the Choice of Numerical Fluxes for Discontinuous Galerkin Methods for Coupled Hyperbolic-Parabolic Flows, *Finite Element Circus*, Rutgers University (10/05).
38. Modeling Transition Flows Between Advection and Diffusion Regimes, *Eighth U.S. National Congress on Computational Mechanics (USNCCM VIII)*, Austin, Texas (07/05). (Invited Talk in Minisymposium)
39. An Operator Splitting Technique for Incompressible Flows, *Third M.I.T. Conference*, Boston, MA, (06/05). (Invited Talk in Minisymposium)
40. Discontinuous Galerkin Methods for Dynamic Viscoelasticity, *Finite Element Circus*, University of Delaware (04/05).
41. A Discontinuous Galerkin Method for the Coupled Problem of Stokes and Darcy, *European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS)*, Jyvaskyla, Finland (07/04). (Invited Talk in Minisymposium)
42. A Discontinuous Galerkin Method for Solving the Coupled Darcy and Stokes Problems, *Workshop on Numerical Analysis of Partial Differential Equations*, Universidad de Concepcion, Chile (01/04). (Invited Talk in Minisymposium)
43. Coupling DG and MFE for Stokes/Darcy Flow, *Finite Element Circus*, Cornell University (11/03).
44. Coupling conservative methods for Darcy flow and Stokes flow, *European Conference on Numerical Mathematics and Advanced Applications ENUMATH 2003*, Charles University, Prague, Czech Republic (08/03). (Invited Talk in Minisymposium)

45. A Discontinuous Galerkin Discretization of Two-Phase Flow in Porous Media, *SIAM Geosciences*, Austin, Texas (03/03). (Invited Talk in Minisymposium)
46. Discontinuous Finite Element Methods for Solving the Stokes and Navier-Stokes Equations, *982nd AMS Meeting*, University of Central Florida, Orlando, Florida (11/02). (Invited Talk in Minisymposium)
47. Superconvergence and H(div) Projection for Discontinuous Galerkin Methods, *Finite Element Circus*, State College, PA (10/02).
48. Applications of Discontinuous Galerkin Methods to Environmental Problems, *Fifth World Congress on Computational Mechanics*, Vienna, Austria (07/02). (Invited Talk in Minisymposium)
49. Miscible Displacement in Porous Media, *XIV International Conference on Computational Methods in Water Resources*, Delft, The Netherlands (06/02). (Invited Talk in Minisymposium)
50. High-Order Discretization of Two-Phase Flow, *Industrial Affiliates Meeting*, Center for Subsurface Modeling, Austin, TX (11/01).
51. Discontinuous Galerkin Methods for Subsurface Flow, *2001 SIAM Annual Meeting*, San Diego, CA (07/01). (Invited Talk in Minisymposium)
52. Discontinuous Galerkin Methods for Fractured Porous Media, *Sixth SIAM Conference on Mathematical and Computational Issues in the Geosciences*, Boulder, CO (06/01). (Invited Talk in Minisymposium)
53. Discontinuous Galerkin Methods for Subsurface Flow and Wave Propagation, *Transport on Unstructured Grids*, US Army Corps of Engineers, Engineers Research and Development Center, Vicksburg, MS (11/00).
54. Discontinuous Galerkin Methods for Subsurface Flow and Wave Propagation, *Industrial Affiliates Meeting*, Austin, TX (10/00).
55. A Posteriori Error Estimates for Discontinuous Galerkin Methods Applied to Elliptic Problems, *p and hp Finite Element Methods: Mathematics and Engineering Practice*, Washington University, St. Louis, MS (05/00-06/00).
56. Discontinuous Galerkin Methods for Flow and Transport Problems in Porous Media, *SuperConvergence in Finite Element Methods*, Texas Tech University, TX (05/00).
57. Discontinuous Galerkin Methods for Flow and Transport Problems in Porous Media, *Finite Elements in Flow Problems 2000*, The University of Texas at Austin, Austin TX (05/00). (Invited Talk in Minisymposium)
58. Discontinuous Galerkin Method for Single Phase Flow, *Fifth SIAM Conference on Mathematical and Computational Issues in the Geosciences*, San Antonio, TX (03/99). (Invited Talk in Minisymposium)
59. Discontinuous Galerkin Method for Single Phase Flow, *Industrial Affiliates Meeting*, Center for Subsurface Modeling, Austin, TX (11/98).
60. Discontinuous Galerkin Methods, *Finite Element Rodeo*, College Station, TX (03/98).

Workshops Participation

- *The OpEd Project* workshop, Rice University, 12/14.
- *Reactive Flows in Deformable Complex Media* workshop at Oberwolfach, 09/14, Oberwolfach, Germany.
- *Rice 2013 Oil & Gas High Performance Computing Workshop*, 03/13, poster.
- *Energy and Environment* workshops, Rice University.
- *Rice 2012 Oil & Gas High Performance Computing Workshop*, 03/12, poster.
- Multiphysics Simulations: Challenges and Opportunities workshop, Institute for Computing in Science, UT (08/11).

- *2008 Center for Inflammation and Regeneration Modeling Retreat*, talk on Signaling modeling (05/08).
- *Network Dynamics and Cell Physiology*, the Institute for Mathematics and its Applications, Minnesota (04/08).
- *Discontinuous Galerkin Methods for Partial Differential Equations*, Banff International Research Station, Banff, Canada (11/07).
- *2007 Center for Inflammation and Regeneration Modeling Retreat*, talk on NEC modeling (05/07).
- *2006 McGowan Institute for Regenerative Medicine Retreat*, poster on agent-based modeling (03/06).
- *Workshop on Compatible Spatial Discretizations for Partial Differential Equations*, the Institute for Mathematics and its Applications, Minnesota; poster on two-phase flow modeling (05/04).
- *Meeting on Discontinuous Galerkin Methods at Oberwolfach*, Oberwolfach, Germany (05/02): talk “A DG Method with Non-Overlapping Domain Decomposition for the Stokes and the Navier-Stokes Problems”.
- *Reactive Flow and Transport Phenomena, Resource Recovery*, Institute for Mathematics and its Applications, University of Minnesota, MN (02/00).
- *Differential Equations and their Applications*, The University of Houston, TX (10/99).
- *Symposium on Discontinuous Galerkin Methods*, Newport, RI (05/99).
- *Specialty Workshop on Adaptive Grids*, The University of Texas at Austin, Austin, TX (03/99).
- *British Petroleum Exploration Training Classes on Fundamentals of Reservoir Simulation*, Austin, TX (09/98).
- *Industrial Affiliates Meeting*, Center for Subsurface Modeling, Austin, TX (11/97): poster on Discontinuous Galerkin for Flow in Porous Media.

Awards

- *8th IMACS 2009 most successful papers award*, 2010.
- *4rth IMACS 2007 most successful papers award*, 2008.
- *J.T. Oden Research Faculty Fellowship* recipient, 2004
- *Association for Women in Mathematics* travel grant, 2002.
- *Association for Women in Mathematics* grant to participate in the AWM workshop, SIAM Annual meeting 2001.
- *Continuing University Fellowship*, The University of Texas, 1998.
- *Computational and Applied Mathematics* Fellowships, The University of Texas, 1997-1998.
- *Jean Zellidja* Fellowship from the French Academy, France, 1994.

Professional Visits

- IFPEN, Summer 2016.
- Laboratoire Jacques Louis Lions, University Paris VI, 05/14, funded by Paris VI.
- Laboratoire Jacques Louis Lions, University Paris VI, 05/04-06/04, funded by NSF-AWM.
- BICOM, Brunel University, England, 12/03, funded by BICOM.
- ICES, The University of Texas at Austin, 05/03 and 04/04-05/04, funded by ICES.

TEACHING

Courses

For classes taught at Rice, instructor effectiveness (class and mean) are the numbers in parentheses.

- Undergraduate Course *Senior Design*, CAAM 495, 496 (1.90, Rice mean=1.70).
- Graduate course *Numerical Analysis I*, CAAM 453 Fall 2008 (1.84, Rice mean=1.86), CAAM 453/553 Fall 2011 (1.94/1.08, Rice mean=1.79), CAAM 553 Fall 2013 (1.50, Rice mean=1.81).
- Graduate course *Numerical Methods for Partial Differential Equations*, M3071, Fall 2007; CAAM 452 Spring 2009 (1.37, Rice mean=1.82), Spring 2010 (1.75, Rice mean=1.82), Spring 2011 (1.50, Rice mean=1.77), Spring 2012 (1.36, Rice mean=1.78), Spring 2013 (1.61), Spring 2014 (1.74, Rice mean=1.75).
- Graduate course *Finite Element Methods*, M3072, Spring 2003 and Spring 2005; CAAM 552 Fall 2009 (1.22, Rice mean=1.83) and Fall 2012 (1.43, Rice mean=1.77).
- Graduate course *Topics in Num Diff Eqns*, CAAM 652 Spring 2014 (1.29)
- Graduate seminar *Scientific Computing and Numerical Analysis*, CAAM 699.006 Spring 2009 (1.00, Rice mean=1.82), Fall 2009 (1.25, Rice mean=1.83), Spring 2010 (1.29, Rice mean=1.82), Fall 2010 (1.50, Rice mean=1.79), Spring 2011 (1.33, Rice mean=1.77), Fall 2011 (1.33, Rice mean=1.79), Spring 2012 (1.13, Rice mean=1.78), Fall 2012.
- Graduate course *Numerical Methods in Scientific Computing I* M2070, Fall 2003, Fall 2005 and Fall 2006.
- Graduate course *Iterative Methods* M2030, Spring 2008.
- Graduate course *Numerical Methods in Scientific Computing II* M2071, Spring 2004, Spring 2006 and Spring 2007 .
- Graduate course *Advanced Scientific Computing II* M2602, Spring 2006.
- Graduate course *Advanced Scientific Computing III* M2603, Fall 2004.
- Graduate course *Advanced Scientific Computing IV* M2604, Spring 2007.
- Graduate course *Numerical Solutions of Ordinary Differential Equations* M2090, Fall 2004 and Fall 2002.
- Undergraduate course *Introduction to Matrices and Linear Algebra* M0280, Fall 2007.
- Undergraduate course *Numerical Linear Algebra* M1080, Spring 2006.
- Undergraduate course *Matrix Theory and Differential Equations* M0250, Fall 2002, Fall 2003 and Fall 2005. Course leader for Fall 2003 and Fall 2005.
- Independent study *Modeling of Flow and Transport Using Discontinuous Galerkin* M2990, Fall 2004.
- Directed study *Discontinuous Solution of Two-Phase Flow* M3902, Summer 2004 and 2005.
- Directed study *Finite Element Methods* M3902, Summer 2003.

DEPARTMENTAL SERVICE

Departmental Committees

- 2015-present: Chair of CAAM department, Rice University.
- 2009-2013 Chair of CAAM graduate committee, Rice University.
- 2008/2009 Member of CAAM graduate committee, Rice University.
- 2009, 2011-2013: CAAM Numerical Analysis Examination Committee
- 2007/2008 Computing committee (chair), University of Pittsburgh.
- 2007/2008 Graduate committee, University of Pittsburgh.
- 2006/2007 Web site committee, University of Pittsburgh.
- 2005/2007 Undergraduate committee, University of Pittsburgh.
- 2005/2007 Computing committee, University of Pittsburgh.

- 2004/2005 and 2005/2006 Search committee for the tenure-track position in Scientific Computing position, University of Pittsburgh.
- 2003/2004 and 2005/2006 Search committee for the tenure-track position in Mathematical Biology, University of Pittsburgh.
- 2004 Preliminary examination committee, University of Pittsburgh.

Membership to Ph.D. and Master Committees

- Ph.D.: Caleb Magruder (CAAM, Rice U., in progress).
- Ph.D.: Xiaodi Deng (CAAM, Rice U., in progress).
- Ph.D.: Muhong Zhou (CAAM, Rice U.), in progress.
- Ph.D.: Mario Bencomo (CAAM, Rice U.), in progress.
- Ph.D.: Yin Huang (CAAM, Rice U.), 2016.
- Ph.D.: David Medina (CAAM, Rice U.), 2015.
- Ph.D.: Rajesh Gandham (CAAM, Rice U.), 2015.
- Ph.D.: Xin Wang (CAAM, Rice U.), 2012.
- Ph.D.: Drew Kouri (CAAM, Rice U.), 2012.
- Ph.D.: Tommy Binford (CAAM, Rice U.), 2012.
- Ph.D.: Alex Labovschii (U. Pittsburgh), 2008.
- Ph.D.: Monika Neda (U. Pittsburgh), 2007.
- Ph.D.: Judy Day (U. Pittsburgh), 2007.
- Ph.D.: Dejun Xie (U. Pittsburgh), 2007.
- Ph.D.: Gary Hart (U. Pittsburgh), 2007.
- Ph.D.: Gergina Pencheva (U. Pittsburgh), 2007.
- Ph.D.: Leo Rebholz (U. Pittsburgh), 2007.
- Ph.D.: Ahmet Duran (U. Pittsburgh), 2006.
- Ph.D.: Carolina Manica (U. Pittsburgh), 2006.
- Ph.D.: Faranak Pahvleni (U. Pittsburgh), 2004.
- Ph.D.: Adrian Dunca (U. Pittsburgh), 2004.
- Ph.D.: Niyazi Sahin (U. Pittsburgh), 2003.
- Ph.D.: Hattan Tawfiq (U. Pittsburgh), 2002.
- Master: Caleb Magruder (CAAM, Rice U.,).
- Master: Tom Klotz (CAAM, Rice U., 2016).
- Master: Zheng Wang (CAAM, Rice U., 2015).
- Master: Mario Bencomo (CAAM, Rice U., 2015).
- Master: Muhong Zhou (CAAM, Rice U., 2014).
- Master: David Medina (CAAM, Rice U., 2014).
- Master: Jedidiah Gohlke (CAAM, Rice U.), 2013.
- Master: Yin Huang (CAAM, Rice U.), 2013.
- Master: Nichole Stilwell (CAAM, Rice U.), 2013.
- Master: Millie Mays (CAAM, Rice U.), 2012.
- Master: Drew Kouri (CAAM, Rice U.), 2010.
- Master: Eelco Nedelcoor (CAAM, Rice U., 2009).

- Master: Xin Wang (CAAM, Rice U.), 2009.
- Master: Ethan Hyche (U. Pittsburgh), 2007.

UNIVERSITY SERVICE

Membership to Ph.D. and Master Committees

- Ph.D.: Xiaoqun Mu (Chemical and Biomolecular Engineering, Rice U., in progress).
- Ph.D.: Le Wang (Chemical and Biomolecular Engineering, Rice U., in progress).
- Ph.D.: Xuan Huan (Economics, Rice U., in progress).
- Ph.D.: Yang Zhou (Civil and Environmental Engineering, Rice U.), 2016.
- Ph.D.: Andy Huang, Mathematics, Rice U., 2016.
- Ph.D.: Jorge Acosta, Mathematics, Rice U., 2016.
- Ph.D.: Quentin Funk, Mathematics, Rice U., 2016.
- Ph.D.: Charles Conn, Chemical and Biomolecular Engineering, Rice U., 2014.
- Ph.D.: Letao Zhang, Mathematics, Rice U., 2014.
- Ph.D.: Kai Gong, Chemical and Biomolecular Engineering, Rice U., 2013.
- Ph.D.: Yenny Chandra, (Civil and Environmental Engineering, Rice U.), 2013.
- Ph.D.: Taylor McNeill (Mathematics, Rice U.) 2013.
- Ph.D.: Kidist Terefe Zeleke (Mathematics, U. of Houston) 2012.
- Ph.D.: Fakhri Landolsi (Mechanical Engineering Material Sciences, Rice U.) 2011.
- Ph.D.: Cristian Nastase (U. Pittsburgh, 2003).
- Master: David Trevino Garcia (Mechanical Engineering Material Sciences, Rice U.), 2012.
- Qualifying exam: Fakhri Landolsi (Mechanical Engineering Material Sciences, Rice U.) 2010.

COMMUNITY SERVICE

Outreach Activities

- Speaker at the Tapia Math-Science Scholar Program; a summer program for high school students from Houston (2015).
- Organizer of the Summer Math Days at Rice University; a summer program for 20 high school students from Houston: www.caam.rice.edu/~riviere/SummerMath.html; 2009, 2011, 2015.
- Speaker at the Mathematical Institute for Young Women at Rice University: a Summer program for female high school students, Summer 2010 and Summer 2011.
- Panelist at Promoting Diversity at the Graduate Level in Mathematics: a National Forum workshop, Mathematical Sciences Research Institute, CA, 2008.
- Co-organizer with A. Vainchtein of the Summer Math Days 2006 and 2007: Summer programs for high-school students entering grades 10-12.
- Volunteer at “Expanding Your Horizons in Science and Mathematics”, a conference organized to increase the interest of young women in mathematics and science through positive hands-on experience, 1998, 2000.

PROFESSIONAL SERVICE

Editorial Positions

- Member of the Editorial Board for Advances in Water Resources (2009-present)
- Member of the Editorial Board for SIAM Journal on Numerical Analysis (2010-present)
- Member of the Editorial Board for International Journal of Computer Mathematics (2010-2015)

Review of Schools

Member of the Advancement Committee for the review of the direction de recherche Mécatronique et Numérique, Institut Français du Pétrole Energies Nouvelles, 2016.

External Reviewer for Ph.D. Thesis

- External reviewer for Ph.D. thesis of C. Goll, U. Heidelberg, 2014
- External reviewer for Ph.D. thesis of B.J. Grieshaber, U. Cape Town, 2013
- External reviewer for Ph.D. thesis of R. Rankin, U. Strathclyde, 2008

Society Memberships

- Member of the Society for Industrial and Applied Mathematics
- Member of Association for Women in Mathematics
- SIAM Geosciences Activity Group Nominating committee, 2016.
- Secretary of the SIAM Geosciences Activity Group, 2013.
- Member of Interpore, 2012-2014
- Member of the American Mathematical Society
- Member of The Society for Complexity in Acute Illness, 2004-2008.
- Member of International Association for Mathematics and Computers in Simulations, 2008, 2010.

Proposals Reviews

- NSF Panelist (2007, 2008, 2009, 2011, 2014, 2015).
- DOE Panelist (2009).
- External Reviewer for INdAM Fellowships in Mathematics and/or Applications for Experienced Researchers (2012).
- External Reviewer for Simtech Cluster of Excellence, U. Stuttgart (2012, 2013).
- External Reviewer for Swiss National Science Foundation (2009).
- External Reviewer for NSF (2006, 2009-2011, 2016).
- External Reviewer for DOE (2010, 2011).
- External Reviewer for South Carolina EPSCoR/IDeA GEAR program (2010).
- External Reviewer for ANR (Agence Nationale de Recherche: French Research National Agency) (2008, 2012).
- External Reviewer for Grants Submitted to Etablissement de nouveaux chercheurs program, Fonds de Recherche sur la Nature et les Technologies, Quebec (2005).
- External Reviewer for Grants Submitted to CERG: Research Grants Council, Hong Kong (2005-present).
- External Reviewer for Grants submitted to The Petroleum Research Fund (American Chemical Society), (2005, 2007).

Paper Reviews

- Reviewer of manuscripts for *American Institute of Aeronautics and Astronautics (AIAA) Journal*, for *Advances in Water Resources*, for *Applicable Analysis*, for *Applications in Mathematics*, for *Applied Mathematics of the Arabian Journal for Science and Engineering*, for *Applied Numerical Mathematics*, for *Computers and Mathematics with Applications*, for *Computer Methods in Applied Mechanics and Engineering*, for *Communications in Numerical Methods in Engineering*, for *Communication in Computational Physics*, for *Electronic Transactions on Numerical Analysis*, for *IMA Journal of Numerical Analysis*, for *International Journal of Numerical Analysis and Modelling*, for *International Journal for Numerical Methods in Engineering*, for *International Journal for Numerical Methods in Fluids*, for *International Journal of Heat and Fluid Flow*, for *International Journal on Finite Volumes*, for *Journal of Applied Numerical Mathematics*, for *Journal of Computational Physics*, for *Journal of Computational and Applied Mathematics*, for *Journal of Engineering Mathematics*, for *Journal of Fluids Engineering*, for *Journal of Scientific Computing*, for *Mathematics and Computers in Simulation*, for *Mathematics of Computation*, for *Mathematical Modelling and Numerical Analysis* previously RAIRO, for *Mathematical and Computer Modelling*, for *Numerical Methods for Partial Differential Equations*, for *Numerische Mathematik*, for *SIAM Journal on Numerical Analysis*, for *SIAM Journal on Scientific Computing*, for *Society of Petroleum Engineers (SPE) Journal*, for *Quarterly of Applied Mathematics*.
- Reviewer for *Computability in Europe 2009 Proceedings*.
- Reviewer for *Mathematical Reviews*.

Conferences and Workshops Organized

- Co-organizer of AWM workshop, SIAM Annual, 2017.
- Member of Scientific Committee, SIAM Geosciences, 2017.
- Member of Scientific Committee, SimRace, Conference on numerical methods and High performance computing for industrial fluid flows, Paris, December 8-10, 2015.
- Organizer of the conference Finite Element Rodeo, March 3-4, 2012.
- Co-organizer of the 2012 Oberwolfach workshop on Discontinuous Galerkin Methods, 2012.
- Co-organizer of the workshop on splitting and multiscale methods for computational PDEs, Baylor University, September 16-17, 2011
- Host and local organizer of the conference Finite Element Circus at the University of Pittsburgh, April 16-17, 2004.

Mini-symposia and Seminars Organized

- Co-organizer of a mini-symposium on pore-scale modeling for SIAM Geosciences 2015.
- Co-organizer of a mini-symposium on discontinuous Galerkin methods (five sessions) for MAFELAP 2009.
- Organizer of a mini-symposium on discontinuous Galerkin methods (six sessions) for the joint 8th World Congress on Computational Mechanics and the 5th European Congress on Computational Methods in Applied Sciences and Engineering, 2008.
- Organizer of a mini-symposium on wound healing for SIAM Life Sciences, 2008.
- Co-organizer of a mini-symposium on discontinuous Galerkin methods for MAFELAP 2006.
- Chair of a DG minisymposium for Third M.I.T. Conference 2005.
- Organizer of a mini-symposium on discontinuous Galerkin methods for the 4th European Congress on Computational Methods in Applied Sciences 2004.
- Organizer of the Computational Mathematics Seminars for Fall 2003, Spring 2004 and Spring 2006.
- Organizer of two minisymposia on Discontinuous Galerkin Methods for Geosciences, SIAM Geosciences 2003 conference.
- Co-organizer of a minisymposium on Discontinuous Galerkin Methods, Fifth World Congress on Computational Mechanics 2002.