

Prince Chidyagwai

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EDUCATION

Rice University, Houston, Texas USA

Ph.D., Computational and Applied Mathematics, 2010

- Thesis Advisor: Professor Béatrice Rivière
- Thesis Area: Computational Fluid Dynamics: Theory and Implementation
- Thesis Title: “Coupling Surface Flow and Porous Media Flow”

University of Pittsburgh, Pittsburgh, Pennsylvania USA

M.A., Mathematics, 2007

Lafayette College, Easton Pennsylvania USA

B.S., Mathematics, 2005

B.A., Computer Science, 2005

- Graduated Cum Laude, Honors in Mathematics

RESEARCH INTERESTS

- Numerical analysis, Scientific computing, Applied mathematics
- Finite element methods, Discontinuous Galerkin methods, Finite volume methods, Finite difference methods
- Medical applications: Numerical simulations of radiative transfer for radiotherapy
- Computational fluid flow: High order (up to the boundary) numerical techniques for incompressible viscous flow
- Transport and flow in porous media
- Traffic modeling applications: Simulation of traffic flow models

POSITIONS

Research Assistant Professor
Temple University, Department of Mathematics

July 2010-present
Philadelphia, PA

Research Visitor
MIT, Department of Mathematics

May 2011-June 2011
Cambridge, MA

RESEARCH GRANT

NSF Research Grant, Co-PI, DMS-1115269: *Collaborative Research: Numerical approaches for incompressible viscous flow with high order accuracy up to the boundary, September 2011 - August 2014 (in collaboration with Benjamin Seibold (Temple University) and Rodolfo R. Rosales (MIT))*, \$299,992.

AWARDS AND TRAVEL GRANTS

- SIAM Post-doc/Early Career travel award, Spring 2011.
- SIAM student travel award, Summer 2009.
- Predoctoral Fellow, University of Pittsburgh, Spring 2006.
- AMS Waldemar J. Trjitzinsky Memorial Award, Fall 2004.
- Carolyn Van Dyke Prize in Computer Science, Lafayette College, Fall 2003.

- PUBLICATIONS
1. P. Chidyagwai and B. Rivière, A two-grid method for coupled free flow with porous media flow, *Advances in Water Resources*, Volume 34, Issue 9, September 2011, Pages 1113-1123.
 2. P. Chidyagwai, B. Rivière and I. Mishev, On the coupling of finite volume and discontinuous Galerkin method for reservoir simulation problems, *SPE Reservoir Simulation Symposium*, 141971-MS.
 3. P. Chidyagwai, B. Rivière, I. Mishev, On the coupling of finite volume and discontinuous Galerkin method for elliptic problems, *Journal of Computational and Applied Mathematics*, Volume 235, Issue 8, February 2011, Pages 2193-2204.
 4. P. Chidyagwai and B. Rivière, On the solution of the coupled NavierStokes and Darcy equations, *Computer Methods in Applied Mechanics and Engineering*, Volume 198, Issues 47-48, October 2009, Pages 3806-3820.
 5. P. Chidyagwai and B. Rivière, Numerical modelling of coupled surface and subsurface flow systems, *Advances in Water Resources*, Volume 33, Issue 1, January 2010, Pages 92-105.
 6. P. Chidyagwai and C.A. Reiter, A local cellular model for growth on quasicrystals, *Chaos, Solitons & Fractals*, Volume 24, Issue 3, May 2005, Pages 803-812.
 7. P. Chidyagwai and C.A. Reiter, Auxiliary materials for a local cellular model for growth on quasicrystals,(website) <http://ww2.lafayette.edu/~rieterc/mvp/qcgm/index.html/>, 2005.

- PREPRINTS & WORK IN PROGRESS
8. A. Cesmilioglu, P. Chidyagwai and B. Rivière, Coupled surface-subsurface flow and transport problems, Submitted 2010.
 9. P. Chidyagwai, J-C. Nave, R.R. Rosales and B. Seibold, A comparative study of the efficiency of Jet schemes, Submitted 2011.
 10. P. Chidyagwai, M. Frank, P. Monreal and B. Seibold, Discontinuous Galerkin method for 2D non-linear moment closures for radiative transfer, In preparation.

- PROFESSIONAL AND SOCIETY MEMBERSHIPS
- SIAM - Society for Industrial and Applied Mathematics
 - Mathematical Association of America
 - Sigma Xi - Scientific Research Society
 - Association of Computing Machinery
 - Pi Mu Epsilon - Honorary National Mathematics Society

- CONFERENCE AND SEMINAR TALKS
- *Discontinuous Galerkin methods for 2D moment closures for radiative transfer*, Mid-Atlantic Numerical Analysis Day, Temple University, Nov. 2011.
 - *An introduction to the finite element method and applications to computational fluid flow*, Mathematical Adventures and Diversions talk series, Lafayette College, Nov. 2011.
 - *On the coupling of finite volume with discontinuous Galerkin method*, Applied Mathematics and Scientific Computing seminars, Temple University, April. 2011.
 - *Poster: Coupling free with porous media flow*, SIAM Conference on Computational Science & Engineering, Reno NV, March 2011.
 - *Coupling free flow with porous media flow*, Applied Mathematics and Scientific Computing seminars, Temple University, Sept. 2010.
 - *On the solution of the coupled Navier-Stokes and Darcy equations*, Joint Mathematics Meetings, San Francisco CA, Jan. 2010.
 - *Multi-numeric solutions of multi-physics couplings*, Computational and Applied Mathematics Department Numerical Analysis Seminar, Rice University, Fall 2009.
 - *Numerical study of coupling free flow and porous media flow*, Finite Element Rodeo, University of Texas at Austin, 2009.
 - *A weak solution and a multi-numeric solution of the coupled Navier-Stokes and Darcy equations: numerical results*, Computational and Applied Mathematics Graduate Seminar, Rice University, Fall 2008.

- *A weak solution and a multi-numeric solution of the coupled Navier-Stokes and Darcy equations*, Finite Element Circus, Louisiana State University, 2008.
- *A weak solution and a multi-numeric solution of the coupled Navier-Stokes and Darcy equations*, Finite Element Circus, Cornell University, 2007.
- *A weak solution and a multi-numeric solution of the coupled Navier-Stokes and Darcy equations*, Computational Mathematics Seminar, University of Pittsburgh, Fall 2007.
- *A local model for growth on quasicrystals*, Special session on Undergraduate Research, AMS national meetings, Atlanta, January 2005.
- *The Carpenters Rule Problem*, AMS Regional Meeting, University of Pennsylvania, 2003.
- *The Carpenters Rule Problem*, AMS National Meeting, Baltimore, Undergraduate Research Poster session, January 2003.

RESEARCH STUDENTS

Dong Zhou (Graduate student)(co-advising with B. Seibold) Ph.D thesis area: Numerical methods for computational fluid flow (11/2011 -present).

Todd Reeb (Undergraduate student) Project: Mesh generation and visulization tools for computational fluid flow models (12/2011 -present).

TEACHING

Research Assistant Professor July 2010-present
Department of Mathematics Temple University

Graduate Courses:

- Spring 2011, *Topics in Numerical Analysis: The Finite Element Method.*

Undergraduate Courses:

- Fall 2010, Multivariable calculus.
- Fall 2011, Multivariable calculus.

Instructor Summer 2006, Spring 2008
Department of Mathematics University of Pittsburgh

- Business calculus.

Research Mentor Summer 2009
Department of Computational And Applied Mathematics Rice University

- *Mentored a summer undergraduate student developing finite element code in a research program funded by the Rice University Alliances for Graduate Education and the Professoriate*

Teaching Fellow Spring 2007, Summer 2007, Spring 2008
Department of Mathematics University of Pittsburgh

- Analytic geometry and multi-variable calculus.
- Honors calculus 1 & 2.
- Analytic geometry and calculus 2.

Teaching Assistant Fall 2005, Fall 2006
Department of Mathematics University of Pittsburgh

- Business calculus
- Analytic geometry and calculus 2