CURRICULUM VITAE

Felipe Pereira
Professor of Mathematics

Mathematical Sciences Department
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Felipe Pereira
Born: January 31, 1962

Education
Ph.D. in Applied Mathematics, The University at Stony Brook, 1992
M.Sc. in Mathematics, New York University, Courant Institute, 1988
M.Sc. in Physics, Federal University of Minas Gerais – Brazil, 1985
B.S. in Physics, Federal University of Minas Gerais – Brazil, 1983

Professional Experience
Professor of Mathematics, The University of Texas at Dallas, 2014--
SER Distinguished Professor of Petroleum Engineering, Univ. of Wyoming, 2013--2014
SER Distinguished Professor of Mathematics, Univ. of Wyoming, 2008--2014
Professor of Computational and Applied Mathematics, IPRJ/UERJ, 1999--2007
Visiting Professor, IPRJ/UERJ, 1997--1999
Associate Researcher (with tenure), LNCC/CNPq, 1997--1999
Visiting Associate Researcher, LNCC/CNPq, 1995--1997
Visiting Assistant Professor, Purdue University, 1994--1995
Research Assistant Professor, Purdue University, 1992--1994
Research Assistant, SUNY at Stony Brook, 1990--1992

Recognition
Extraordinary Merit in Research Award**,** College of Arts and Science, University of Wyoming, 2012
Editor: Computational and Applied Mathematics (CAAM, http://www.sbmac.org.br/publi_comp.php), 2002—2012
Member: Advisory Board of the Graduate Programs at UERJ, 2004--2006
Guest Editor: Special Issue on Multi-Scale Science (CAAM), 2004
Program Officer: CNPq, Mathematical Sciences, 2003--2005
Guest Editor: Special Issue on Multi-Scale Science (CAAM), 2002

Professional Services
Associate Director: Center for Fundamentals of Subsurface Flow (SER Center of Excellence), University of Wyoming, 2012-2013
Founding Member and First Director: Center for Fundamentals of Subsurface Flow (SER Center of Excellence), University of Wyoming, 2010-2011
Chair: Scientific Committee of the XXIX Brazilian Applied, Mathematics Meeting (CNMAC), 2006
Vice-President: Brazilian Society for Applied Mathematics (SBMAC), 2006--2007
Head: Department of Computational Modeling, IPRJ-UERJ, 2002-2004
Member: Graduate Committee, IPRJ-UERJ, 2002-2004
Chair: Graduate Program in Computational Modeling, IPRJ-UERJ, 2000-2001
Member: Graduate Committee, IPRJ-UERJ, 1999-2000

Current Research Interests
1. Numerical Simulation of Multiphase Flows in Multiscale Porous Media: CO2 sequestration, oil reservoirs, contaminant transport
2. Uncertainty Quantification
3. Numerical Methods for Partial Differential Equations
4. High Performance, Parallel, Scientific Computing

Theses
1. ``Multiscale Flow and Transport in Porous Media", Full Professor Thesis, IPRJ-UERJ, 1999.
2. ``Stochastic Geology and Porous Media Flow: Theory and Simulations", Ph.D. Thesis, SUNY at Stony Brook, Department of Applied Mathematics and Statistics, August 1992. Thesis Advisor: James Glimm.

3. ``The Spectrum of the Z_2 Quantum Gauge-Higgs Field Theory on the Lattice in 2+1 Dimensions", M.Sc. Thesis, Federal University of Minas Gerais, Department of Physics, Brazil, July 1985. Thesis Advisor: Michael Louis O'Carroll.

Book Editor

1. First School on Multiscale Computational Modeling, Editors: M. Murad, F. Pereira, H. P. Amaral Souto, M. Cruz and G. Braga, ISBN 85905048-1-6, 2005, LNCC (in Portuguese).

Refereed Publications

1. V. Ginting, F. Pereira, and A. Rahunanthan (2014), A prefetching technique for prediction of porous media flows, *Computational Geosciences,* 18, pp. 661-675.
2. A. Francisco, V. Ginting, F. Pereira, J. Rigelo (2014), Design and Implementation of a Multiscale Mixed Method for Porous Media Flows, *Mathematics and Computers in Simulation*, 99, pp. 125-138.
3. J. Douglas, Jr., F. Pereira, C. Zemtsop (2014), Model Development for the Numerical Simulation of CO2 Storage in Naturally Fractured Saline Aquifers. *Computational Models for CO2 Sequestration and Compressed Air Energy Storage,* Taylor & Francis Group/CRC Press, Rafid Al-Khoury and Jochen Bundschuh, Eds. .
4. V. Ginting, F. Pereira, A. Rahunanthan (2014), Rapid Quantification of Uncertainty in Permeability and Porosity of Oil Reservoirs for Enabling Predictive Simulation, *Mathematics and Computers in Simulation,* 99, 139-152.
5. V. Ginting, F. Pereira, A. Rahunanthan (2013), A Multi-stage Bayesian Prediction Framework for Subsurface Flows, *International Journal for Uncertainty Quantification*, 3, pp. 499-522.
6. V. Ginting, F. Pereira, A. Rahunanthan (2012), Multiple Markov Chains Monte Carlo Approach for Flow Forecasting in Porous Media, *Procedia Computer Science*, v. 5, pp. 707-716.
7. V. Ginting, F. Pereira, A. Rahunanthan (2011), Forecasting Production in an Oil Reservoir Simulation and Its Challenges, *Proceedings of ENUMATH 2012, the 9th European Conference on Numerical Mathematics and Advanced Applications*, Leicester - United Kingdom, (A. Cangiani et al., eds.), Springer.
8. M. Mendes, M. Murad and F. Pereira (2011), A New Computational Strategy for Solving Two-Phase Flow in Strongly Heterogeneous Poroelastic Media of Evolving Scales. *International Journal for Numerical and Analytical Methods in Geomechanics*, 36, pp. 1683-1716.
9. F. Furtado, V. Ginting, F. Pereira, M. Presho (2011), Operator Splitting Multiscale Finite Volume Element Method for Two-Phase Flow with Capillary Pressure, *Transport in Porous Media*, 90, no. 3, pp. 927-947.
10. V. Ginting, F. Pereira, M. Presho, S. Wo (2011), Application of the Two-stage Markov Chain Monte Carlo Method for Characterization of Fractured Reservoirs using a Surrogate Flow Model, *Computational Geosciences*, 15, no. 4, pp. 691-707.
11. J. Aquino, A.S. Francisco, F. Pereira, H.P. Amaral Souto (2011), A hybrid method for the simulation of radionuclide contaminant plumes in heterogeneous unsaturated formations, *Progress in Nuclear Energy*, Volume 53, Issue 8, pp. 1159–1166.
12. F. Pereira and A. Rahunanthan (2011), A Semi-discrete Central Scheme for the Approximation of Two-phase Flows in Three Space Dimensions, *Mathematics and Computers in Simulation*, Volume 81, Issue 10, pp. 1935-2370.
13. M. R. Borges, F. Pereira, H. P. Amaral Souto (2010), Efficient Generation of Multi-scale Random Fields: a Hierarchical Approach. *International Journal for Numerical Methods in Biomedical Engineering*, Vol. 26, 2, 176-189.
14. C. Douglas, F. Furtado, V. Ginting, M. Mendes, F. Pereira, M. Piri (2010), On the development of a high-performance tool for the simulation of CO_2 injection into deep saline aquifers, *Rocky Mountain Geology*, Vol. 45, N. 2, pp. 151-161.
15. J. Aquino, T. J. Pereira, A. S. Francisco, F. Pereira, H. P. Amaral Souto (2010), A Lagrangian Strategy for the Numerical Simulation of Radionuclide Transport Problems, *Progress in Nuclear Energy*, Vol. 52, 3, pp. 282-291.
16. F. Pereira, A. Rahunanthan (2010), Numerical Simulation of Two-phase Flows on a GPU. In: Proceedings of 9th International Meeting, High Performance Computing for Computational Science (VECPAR 2010). Berkeley, CA.

17. M. R. Borges, M. Murad, F. Pereira and F. Furtado (2009), A New Multiscale Scheme for Computing Statistical Moments in Single Phase Flow in Heterogeneous Porous Media, *Water Resources Research,* Vol. 32, pp. 361-382.
18. E. Abreu, F. Pereira, S. Ribeiro, Central Schemes for Porous Media Flow (2009), *Computational and Applied Mathematics*, Vol. 28, N. 1, pp. 87-110.
19. E. Abreu, Jim Douglas, Jr., F. Furtado and F. Pereira (2009), Operator Splitting for Three-phase Flow in Heterogeneous Porous Media, *Communications in Computational Physics,* Vol. 6, No. 1, pp. 72-84.
20. M. R. Borges, F. Furtado, F. Pereira and H. P. Amaral Souto (2008), Scaling Analysis for the Tracer Flow Problem in Self-Similar Permeability Fields, *SIAM Multiscale Model. Simul*., Vol. 7, Issue 3, pp. 1130-1147.
21. J. Aquino, A. S. Francisco, F. Pereira, H. P. Amaral Souto (2008), A Two-Stage Operator Splitting Algorithm for the Numerical Simulation of Contaminant Transport in Porous Media, *International Journal of Computational Science*, v. 2, N. 3, pp. 315-335.
22. E. Abreu, Jim Douglas Jr., F. Furtado and F. Pereira (2008), Operator Splitting Based on Physics for Flow in Porous Media, *International Journal of Computational Science*, v. 2, 3, pp. 315-335.
23. J. Aquino, A. S. Francisco, F. Pereira, H. P. Amaral Souto (2008), An Overview of Eulerian-Lagrangian Schemes Applied to Radionuclide Transport in Unsaturated Porous Media, *Progress in Nuclear Energy*, v. 50, 7, pp. 774-787.
24. S. Mancuso, F. Pereira, G. De Sousa (2007), A New Eulerian-Lagrangian Scheme for the Approximation of Conservation Laws, *Tendencies in Applied Mathematics,* (*TEMA-SBMAC)*, Vol. 8, N. 2, pp. 277--286 (in Portuguese).
25. S. Mancuso, F. Pereira, G. De Sousa (2007), Mesh Adaptivity in the Lagrangian Approximation of Conservation Laws, *Tendencies in Applied Mathematics,* (*TEMA-SBMAC)*, Vol. 8, N. 2, pp. 269--276 (in Portuguese).
26. J. Aquino, A. S. Francisco, F. Pereira, H. P. Amaral Souto (2007), A Forward Tracking Scheme for Solving Radionuclide Advective Problems in Unsaturated Porous Media, *International Journal of Nuclear Energy Science and Technology,* Vol. 3, N. 2, pp. 196--205.
27. J. Aquino, A. S. Francisco, F. Pereira, H. P. Amaral Souto, F. Furtado (2007), Numerical Simulation of Transient Water Infiltration in Heterogeneous Soils Combining Central Schemes and Mixed Finite Elements, *Communications in Numerical Methods in Engineering,* Vol. 23, N. 6, pp. 491--505.
28. E. Abreu, F. Furtado, J. Douglas, Jr., D. Marchesin and F. Pereira (2006), Three-phase immiscible displacement in heterogeneous petroleum reservoirs, *Mathematics and Computers in Simulation,* v. 73, Issues 1-4, pp. 2--20.
29. A. Francisco, J. Aquino, F. Pereira and H. Souto (2006), Numerical simulation of the impact of water-air fronts in radionuclide plumes in heterogeneous porous media, *Thermal Engineering*, v. 5, n. 1, pp. 71--78.
30. A. Francisco, J. Aquino, F. Pereira and H. Souto (2006), Numerical simulation of transient water infiltration in heterogeneous soils combining central schemes and mixed finite elements. *Communications in Numerical Methods in Engineering*, v. 23, Issue 6, pp. 491—505.
31. E. Abreu, F. Furtado, D. Marchesin and F. Pereira (2004), Transitional waves in three-phase flow in heterogeneous formations. In: G. F. Pinder; W. G. Gray; M. W. Farthing; C. T. Miller. (Org.). Computational Methods in Water Resources. Elsevier, v. 1, pp. 609-620.
32. F. Furtado and F. Pereira (2004), On the scale up problem for two-phase flow in petroleum reservoirs, *Cubo a Mathematical Journal*, v. 6, n. 4, pp. 53--72.
33. A. Francisco, J. Aquino, F. Pereira and H. Souto (2004), Numerical Simulation of Radionuclide Transport in Unsaturated Heterogeneous Porous Media. In: G. F. Pinder; W. G. Gray; M. W. Farthing; C. T. Miller. (Org.). Computational Methods for Water Resources, II.1 Porous Medium Applications. Elsevier, v. 2, pp. 991-1002.
34. D. Frias, M. Murad and F. Pereira (2004), Stochastic Computational Modeling of Highly Heterogeneous Poro-elastic Media with Long-Range Correlations, *International Journal For Numerical and Analytical Methods in Geomechanics*, v. 28, n. 1, pp. 1-32.
35. V. Arthus, F. Furtado, B. Noetinger and F. Pereira (2004), Stochastic Analysis of Two-Phase Immiscible Flow in Stratified Porous Media, *Computational and Applied Mathematics*, v. 23, n. 2-3, pp. 153-172.
36. E. Abreu, F. Furtado, and F. Pereira (2004), On the numerical simulation of three-phase reservoir transport problems, *Transport Theory and Statistical Physics*, v. 33, n. 5-7, pp. 503--526.

37. J. Douglas, Jr., D. Frias, N. Henderson and F. Pereira (2003), Simulation of single-phase multicomponent flow problems in gas reservoirs by Eulerian-Lagrangian techniques. *Transport In Porous Media*, v. 50, n. 3, p. 307-342.
38. F. Furtado and F. Pereira (2003), Crossover from nonlinearity controlled to heterogeneity controlled mixing in two-phase porous media flows, *Computational Geosciences*, v. 7, pp. 115-135.
39. F. Furtado and F. Pereira (2003), Fluid mixing in multiphase porous media flows. In: K. J. Bathe. (Org.). Computational Fluid and Solid Mechanics. Elsevier, v. 2, pp. 1350-1354.
40. D. Frias, M. Murad and F. Pereira (2002), Computational Modeling of Reservoir Compaction Due to Fluid Withdrawal, *Computational and Applied Mathematics*, v. 22, pp. 607-629.
41. J. Douglas, Jr., F. Pereira and L. M. Yeh (2002), Relations between phase mobilities and capillary pressures for two-phase flows in fractured media. In: Z. Chen; R. Ewing. (Org.). Fluid flow and transport in porous media: mathematical and numerical treatment (CONM Book Series). American Mathematical Society, v. 295, p. 159-171.
42. C. Almeida, J. Douglas, Jr., F. Pereira and L. C. Roman (2002), Algorithmic aspects of a locally conservative Eulerian-Lagrangian method for transport-dominated diffusive systems. In: Z. Chen; R. Ewing. (Org.). Fluid flow and transport in porous media: mathematical and numerical treatment (CONM Book Series). American Mathematical Society, v. 295, p. 37-48.
43. C. Almeida, J. Douglas, Jr., and F. Pereira (2002), A new characteristics-based numerical method for miscible displacement in heterogeneous formations. *Computational and Applied Mathematics*, v. 22, pp. 573-605.
44. J. Douglas, Jr., F. Pereira and L. C. Roman (2002), Algorithmic aspects of a locally conservative eulerian-lagrangian method for 3D porous media flow. In: S. M. Hassanizadeh; R. J. Schotting; W. G. Gray; G. F. Pinder. (Org.). Mathematical and Numerical Modeling for Subsurface and Surface Problems. Amsterdam: Elsevier, v. II, pp. 971-978.
45. J. Douglas, Jr., D. Frias and F. Pereira (2001), Operator Splitting for Compressible Miscible Displacement in Porous Media. In: P. Minev; Y. Lin. (Org.). Scientific Computing and Applications - Advances in Computation: Theory and Practice. Huntington: Nova Science Publishers, v. 7, pp. 67-74.
46. J. Douglas, Jr., F. Pereira, and L. M. Yeh (2000), A locally conservative Eulerian-Lagrangian numerical method and its application to nonlinear transport in porous media, *Computational Geosciences*, v. 4, pp. 1-40.
47. J. Douglas, Jr., F. Pereira, and L. M. Yeh (2000), A locally conservative Eulerian-Lagrangian method for flow in a porous medium of a mixture of two components having different densities, In: Zhangxin Chen; Richard Ewing; Z.-C. Shi. (Org.). Numerical Treatment of Multiphase Flows in Porous Media. Berlin, Heidelberg, New York: Springer-Verlag, v. 552, pp. 138-155.
48. J. Douglas, Jr., C-S Huang and F. Pereira (1999), The modified method of characteristics with adjusted advection, *Numerische Mathematik*, Springer-Verlag, v. 83, pp. 353--369.
49. J. Douglas, Jr., C-S Huang and F. Pereira (1999), The modified method of characteristics with adjusted advection for an immiscible displacement problem, In: Z. Chen; Y. Li; C. A. Michelli; Y. Xu. (Org.). Advances in computational mathematics. New York: Marcel Dekker, v. 202, pp. 53-74.
50. F. Furtado and F. Pereira (1998), Mixing regimes and the scale-up problem for multiphase flow. In: V. N. Burganos; G. P. Karatzas; A. C. Payatakes; C. A. Brebbia; W. G. Gray; G. F. Pinder; A. Mikelic. (Org.). Computational Methods in Surface and Ground Water Transport. Boston: Computational Mechanics Publications, v. II, pp. 83-90.
51. J. Douglas, Jr., F. Furtado, F. Pereira and L. M. Yeh (1998), Numerical methods for transport-dominated flows in heterogeneous porous media. In: V. N. Burganos; G. P. Karatzas; A. C. Payatakes; C. A. Brebia; W. G. Gray; G. F. Pinder; A. Mikelic. (Org.). Computational Methods in Surface and Ground Water Transport. Boston: Computational Mechanics Publications, v. I, pp. 469-476.
52. F. Furtado and F. Pereira (1998), Scaling analysis for two-phase immiscible flow in heterogeneous porous media, *Computational and Applied Mathematics*, v. 17, # 3, pp. 233--262.
53. J. Douglas, Jr., F. Pereira, and L. M. Yeh (1997), A parallelizable method for two-phase flows in naturally-fractured reservoirs, *Computational Geosciences*, v. 1, # 4, pp. 333--368.
54. J. Douglas, Jr., F. Furtado, F. Pereira (1997), Multiscale flow and transport in porous media, *Technology-Science-Petroleum*, Reservoir Engineering, CENPES/PETROBRAS, v. 1, pp. 37--46.
55. J. Douglas, Jr., F. Furtado, F. Pereira (1997), On the numerical simulation of waterflooding of heterogeneous petroleum reservoirs, *Computational Geosciences*, v. 1, # 2, pp. 155-190.

56. J. Douglas, Jr., F. Pereira and J. Santos (1995), Parallel numerical simulation of waves in dispersive media, Proceedings of the Fourth International Congress of the Brazilian Geophysical Society, vol. 1, Rio de Janeiro, Brazil, pp. 417—419.
57. J. Douglas, Jr., F. Furtado, F. Pereira (1996), Parallel methods for immiscible displacement in porous media, *Wuhan University Journal of Natural Sciences*, vol. 1, pp. 502--507.
58. J. Douglas, Jr., F. Pereira, and L. M. Yeh (1995), A parallelizable characteristic scheme for two phase flow I: single porosity systems, *Computational and Applied Mathematics*, vol. 14, pp. 73--96.
59. J. Douglas, Jr., F. Furtado, F. Pereira (1995), The statistical behavior of instabilities in immiscible displacement subject to fractal geology. In: Mathematical Modeling of Flow Through Porous Media, (A. P. Bourgeat, C. Carasso, S. Luckhaus, and A. Mikelic, eds.), World Scientific, pp. 115--137.
60. J. Douglas, Jr., F. Pereira and J. Santos (1995), A parallelizable approach to the simulation of waves in dispersive media, Proceedings of the Third International Conference on Mathematical and Numerical Aspects of Wave Propagation (G. Cohen, ed.), SIAM, pp. 673--682.
61. J. Douglas, Jr., P. J. Paes Leme, F. Pereira and L. M. Yeh (1994), Domain decomposition for immiscible displacement in single porosity systems, Finite Element Methods: fifty years of the Courant element (M. Kvrivzek, P. Neittaanmaki, and R. Stenberg, eds.), Lecture Notes in Pure and Applied Mathematics, vol. 164, Marcel Dekker, New York, NY, pp. 191--199.
62. J. Douglas, Jr., P. J. Paes Leme, F. Pereira and L. M. Yeh (1993), A massively parallel iterative numerical algorithm for immiscible flow in naturally fractured reservoirs. In: Flow in Porous Media (J. Douglas, Jr., and U. Hornung, eds.), International Series of Numerical Mathematics, vol. 114, Birkhauser Verlag, Basel, pp. 75--94.
63. J. Glimm, B. Lindquist, F. Pereira and Q. Zhang (1993), A theory of macrodispersion for the scale up problem, *Transport in Porous Media*, vol. 13, pp. 97--122.
64. J. Glimm, B. Lindquist, F. Pereira and R. Peierls (1992), The fractal hypothesis and anomalous diffusion, *Computational and Applied Mathematics*, vol. 11, pp. 75--93.
65. J. Glimm, F. Furtado, B. Lindquist, F. Pereira and Q. Zhang (1991), Time dependent anomalous diffusion for flow in multi--fractal porous media. In: Numerical Methods for the Simulation of Multiphase and Complex Flow (T.M.M. Verheggan, ed.), Lecture Notes in Physics, vol. 398, Springer Verlag, New York, pp. 79--89.
66. F. Furtado, J. Glimm, B. Lindquist, and F. Pereira (1991), Characterization of mixing length growth for flow in heterogeneous porous media, Proceedings of the 11th SPE Symposium on Reservoir Simulation, Soc. of Petroleum Engineers of AIME, Richardson, TX, pp. 317--322.
67. F. Furtado, J. Glimm, B. Lindquist, and F. Pereira (1990), Multi-length scale computations of the mixing length growth in tracer flow, Proceedings of the Emerging Technologies Conference (F. Kovarik, ed.), Institute for Improved Oil Recovery, U. Houston, pp. 251--259.

Funding in the USA (2008--)

1. (2015-2017) EDT: Team Training Mathematical Scientists Through Industrial Collaborations S. Minkoff (PI), Y. Cao, Y. Gel, F. Pereira, J. Zweck (Co-PIs), NSF-DMS-1514808.
2. (2014-2017) The Mathematics of Unconventional Reservoirs (Science Without Borders Project), PIs M. Tome (University of Sao Paulo, Brazil), F. Pereira (USA), CNPQ/Brazil. Funding in Brazil for 3 one-year visits for Brazilian graduate students to visit UTD; Funding for one post-doc in Brazil.
3. (2011-2014) Pore-to-Core-to-Reservoir Modeling of Geologic Storage of Supercritical CO2 in Deep Fractured Saline Aquifers, M. Piri (PI), F. Pereira (Co-PI), 2011 Clean Coal Technologies Research Program.
4. (2010-2013) On the Development of the UW-team Simulator for the Injection of CO_2 in Deep Saline Aquifers; F. Pereira (PI); Frederico Furtado and Victor Ginting (Co-PIs); Center for Fundamentals of Subsurface Flow.
5. (2010-2013) Simulation of CO2 injection in deep saline aquifers with mathematical verification and physical validation; F. Furtado (PI), V. Ginting, F. Pereira (Co-PIs); Center for Fundamentals of Subsurface Flow.
6. (2010-2013) A Bayesian Framework for Enabling Predictive Simulation and Uncertainty Quantification in History Matching Geological Models for CO_2 Injection; V. Ginting (PI), J. Barber, F. Pereira (Co-PIs); Center for Fundamentals of Subsurface Flow.
7. (2010-2013) Maximization of permanent trapping of CO_2 and co-contaminants in the highest-

porosity formations of the Rock Springs Uplift (Southwest Wyoming): Experimentation and multi-scale modeling; M. Piri (PI), F. Furtado, V. Ginting, L. Goual, F. Pereira, S. Yin (Co-PIs); DOE-NETL.
8. (2011-2012) Graduate Assistantship: Numerical Simulation of the Injection of CO2 in Naturally-Fractured Saline Aquifers, SER.
9. (2011-2014) Teaching Assistantship: Development of a new sequence of Calculus courses for Energy Resources Majors, SER.
10. (2010) Support for post-doc Marcos Mendes, Wyoming Carbon Sequestration Steering Committee.
11. (2010—2012) Establishment of the Center for Fundamentals of Subsurface Flow. School of Energy Resources, University of Wyoming.
12. (08/01/2008 - 07/31/2009) Carbon Sequestration Monitoring Activities. DOE-funded, Agreement DE-NT00047-30, PI of Task 9. (Project PI: Carol Frost, University of Wyoming).
13. (08/01/2008 - 07/31/2009) Numerical Simulation of Multiphase Flow in Porous Media. NSF DMS 0821664. co-PI.
14. (01/01/2008 - 06/01/2010) School of Energy Resources Start-up Grant.

Funding in Brazil (Principal Investigator, 2001--)
(Remark: Support for graduate students and post-docs is not included here)

1. The scale-up problem for multiphase flows in petroleum reservoirs. CNPQ Grant Number 473791/2006--4, 2006--2008.
2. Topics in Modeling and Numerical Simulation in Applied Mathematics. PROCIENCIA Honors Grant, awarded first place among all UERJ faculty members, FAPERJ/UERJ, 2006-2009.
3. Mini-symposium on Petroleum Sciences. CNPQ Grant Number 451345/2006--1, 2006.
4. Mini-symposium on Petroleum Sciences. 2006, PETROBRAS.
5. Petrobras Prize for Innovative Technologies. PETROBRAS, 2005.
6. Computational Methods for the Production of Heavy Oils in Heterogeneous Reservoirs. CTPETRO Grant Number 551150/2005--0, 2005-2007.
7. Contaminant Transport in Unsaturated Heterogeneous Porous Media. FAPERJ Grant Number E-26/171.133/2005, 2006-2008.
8. Offshore Enhanced Recovery of Heavy Oil. CTPETRO Grant Number 504733/2004--4, 2004-2006.
9. The Scale-up Problem and Stability for Three-phase Flows in Porous Media. CNPQ Grant Number 490696/2004--0, 2004-2006.
10. Topics in Modeling and Numerical Simulation in Applied Mathematics. PROCIENCIA Honors Grant, FAPERJ/UERJ, 2004-2006.
11. Modeling and Numerical Simulation of Multiphase Flows in Heterogeneous Porous Media. CNPQ Honors Grant, 2004-2007.
12. Modeling and Numerical Simulation of Multiphase Flows in Heterogeneous Porous Media. CNPQ Honors Grant, 2001-2004.
13. Multiscale Modeling of 3D Reservoirs. CTPETRO Grant Number 501886/03--6, 2004-2006.
14. The Scale-up Problem in Petroleum Science. CNPQ Grant Number 470216/2003--4, 2003-2005.
15. XXV Brazilian Applied Mathematics Meeting. CNPQ Grant Number 455368/2002--3, 2002.
16. Multiscale Modeling and Renormalization for Flow in Petroleum Reservoirs. CTPETRO Grant Number 472199/01--3, 2001-2003.
17. Second Symposium on Computational Modeling of Multiscale Phenomena. CNPQ Grant Number 440009/2001--4, 2001.
18. Topics in Modeling and Numerical Simulation in Applied Mathematics. PROCIENCIA Honors Grant, awarded first place among all UERJ faculty members, FAPERJ/UERJ, 2001-2004.
19. Improved Oil Recovery Through Scale Up for Multiphase Flow. CNPQ-NSF International Collaborative Grant (Co-PIs: D. Marchesin and F. Furtado), 2001-2004.

Conference and Seminar Organization

1. 2014, Professors Pereira and Piri organized the *CFSF Workshop: Experimentation, Mathematical Modeling & Numerical Simulation of Porous Media Flows,* on May 19-21, 2014, in Laramie, Wyoming.
2. 2012, Professors Pereira and Piri organized the *Third Workshop on Porous Media Flows: Experimentation, Multi-Scale Modeling & Simulation*, May 8-10, 2012, Hilton Garden Inn Laramie, WY.

3. 2012, Professors Pereira and Piri organized the mini-symposium "CO_2 sequestration: experimentation, multi-scale modeling and simulation" at the *4th International Conference on Porous Media & Annual Meeting of the International Society for Porous Media,* May 14-16, 2012, Purdue University, West Lafayette, Indiana, USA.
4. 2012, Professors Ginting and Pereira organized the mini-symposium "Recent Developments In Uncertainty Quantification For Multiphase Flows In Heterogeneous Subsurface Formations" at the *10^{th} World Congress in Computational Mechanics (WCCM 2012)*, July 8-13, 2012, Hotel Transamerica, Sao Paulo, SP, Brazil.
5. 2012, Professors M. Murad (LNCC/Brazil) and Pereira organized the mini-symposium "Multiscale and Stochastic Modeling of Coupled Phenomena in Porous Media'', at the *5^{th} LNCC meeting on Computational Modeling*, July 16-19, LNCC, Petropolis, RJ, Brazil.
6. 2011, Professor F. Pereira was invited to organize the mini-symposium "Recent Developments in Modeling and Numerical Simulation of Subsurface Flows" at the *International Conference on Mathematical Modeling in Industry*, held at the University of Sao Paulo, Sao Paulo, Brazil, November 30th – December 1st -2nd, 2011.
7. 2006, Mini-symposium in Petroleum Sciences. In the Brazilian Applied Mathematics Meeting (CNMAC), Campinas, SP, Brazil.
8. 2005, Summer School on Modeling of Multiscale Phenomena. LNCC, Petropolis, Brazil. With M. Murad.
9. 2004, Mini-symposium on Multiscale Modeling. 1st LNCC Meeting on Computational Modeling. LNCC, Petropolis, Brazil. With M. Murad.
10. 2002, Brazilian Applied Mathematics Meeting (CNMAC). Chair of the Meeting, Nova Friburgo, RJ, Brazil. II Symposium on Computational Modeling of Multiscale Phenomena. Co-chair of the Meeting, LNCC, Petropolis, RJ, Brazil (sponsored by IUTAM). With M. Murad.
11. 2002, Oil Reservoirs and Aquifers: Mathematical Modeling and Numerical Simulation. Mini-symposium in the Brazilian Applied Mathematics Meeting (CNMAC). Nova Friburgo, RJ, Brazil. With A. Loula and A. Coutinho.
12. 2001, Flow in Heterogeneous Formations: Renormalization Techniques and Direct Numerical Simulation. Mini-symposium in the Sixth SIAM Conference on Mathematical and Computational Issues in the Geosciences, Boulder, CO, USA. With Jim Douglas, Jr..
13. 2000, LNCC/IPRJ Workshop on Multiscale Heterogeneous Systems. Co-chair of the Meeting, IPRJ, Nova Friburgo, RJ, Brazil. With M. Murad.
14. 1999, Renormalization Group and Assymptotic Analysis. Workshop, IPRJ, Nova Friburgo, RJ, Brazil.

Courses Taught (S = Spring; F = Fall)

Undergraduate

- *SUNY at Stony Brook*

Partial Differential Equations (1991)

- *Purdue University*

Calculus I (1995); Differential Equations and Linear Algebra (1996-1997)

- *UERJ*

Linear Algebra (one course each semester, 2000-2008)

- *University of Wyoming*

Reservoir Simulation (2007S); Calculus I/SER (2011F and 2012S); Calculus III/SER (2012F).

Graduate

- *UERJ*

Computational Fluid Dynamics (1997F); Special Topics in Applied Mathematics (1998S); Special Topics in Scientific Computing (1999S); Special Topics in Scientific Computing (1999F); Special Topics in Applied Mathematics (1999F); Flow in Porous Media (2000S); Special Topics in Applied Mathematics (2000F); Oil

Reservoir Simulation (2002F); High Performance Computing (2003S); Special Topics in Computational Modeling (2003S); Numerical Methods for Partial Differential Equations I (2003F); Advanced Topics in Computational Modeling (2004S); Special Topics in Computational Modeling (2004F); Oil Reservoir Simulation (2004F); High Performance Computing (2005S); Numerical Methods for Partial Differential Equations I (2005S); Advanced Topics in Computational Modeling (2005S); Probability Theory (2005F); Oil Reservoir Simulation (2005F); Computational Fluid Dynamics (2005F); High Performance Computing (2006S); Oil Reservoir Simulation (2006F); Special Topics in Computational Modeling (2006F).

- *University of Wyoming*

Reservoir Simulation, PETE 4300/5300 (2008S); Computational Methods III, MATH5345 (2008F); Reservoir Simulation, PETE 4300/5300 (2009S); Computational Methods III, MATH5345 (2009F); Topics Course: Computational Modeling of Subsurface Flows, MATH549003 (2010F); Special Topics in Uncertainty Quantification, MATH549003 (2012S); Special Topics in Porous Media Flows (2013S).

Postdoctoral Associates

1. Celestin Zemtsop, UT Dallas, 2015--.
2. Waqas Ashraf, University of Sao Paulo, 2015--.
3. Hani Akbari, University of Wyoming, 2012.
4. Celestin Zemtsop, University of Wyoming, 2011-2014.
5. Arunasalam Rahunanthan, University of Wyoming, 2009--2012.
6. Marcos Mendes, University of Wyoming, 2008--.
7. Alexandre Santos Francisco, University of Wyoming, 2010.
8. Simone Ribeiro, University of Wyoming, 2008.
9. Marcio Rentes Borges, IPRJ-UERJ, 2005-2006.
10. Alexandre Santos Francisco, IPRJ-UERJ, 2003-2005.

Graduate Student Supervision

Ph.D. degrees supervised

- *Current*

1. Masa Gesho, Petroleum Engineering, University of Wyoming, 2013--.
2. Rafael Guiraldelo, Mathematics, University of Sao Paulo, 2015--.

- *Completed*

1. Ahmad Jan, Mathematics, University of Wyoming, 2011-2015. Post-doc at the Oak-Ridge National Lab.
2. Joyce Rigelo, Mathematics, University of Wyoming, 2008-2013. Post-doc at UT Austin.
3. Thiago Jordem Pereira, Computational Modeling, IPRJ-UERJ, 2013. Thesis: Uncertainty quantification methods for subsurface flows.
4. Jose Antonio Oliveira Aquino, Computational Modeling, IPRJ-UERJ, 2008. Thesis: Numerical simulation of contaminant transport problems in two-phase air-water flows in heterogeneous porous media.
5. Marcos Mendes, Computational Modeling, LNCC-MCT, 2007. Thesis: Computational modeling of two-phase flows in heterogeneous porous media with geomechanics coupling. (Advisor: M. Murad; co-advisor F. Pereira).
6. Simone Ribeiro, Computational Modeling, IPRJ-UERJ, 2007. Thesis: New central differencing schemes for reservoir simulation.
7. Eduardo Cardoso Abreu, Computational Modeling, IPRJ-UERJ, 2007. Thesis: Modeling and numerical simulation of three-phase flows in heterogeneous petroleum reservoirs.
8. Marcio Rentes Borges, Computational Modeling, IPRJ-UERJ, 2006. Thesis: Tracer injection in petroleum reservoirs: multiscale modeling and numerical simulation.
9. Cesar G. de Almeida, Applied Mathematics, IMECC-UNICAMP, 2000. Thesis: Miscible displacement in heterogeneous formations: new numerical methods and stochastic modeling.
10. Diego G. Frias, Computational Modeling. IPRJ-UERJ, 1999. Thesis: Numerical simulation of compressible miscible displacement in porous media.

Masters degrees supervised

- *Completed*

1. Allan Leal, Mathematics, University of Wyoming, 2010. Thesis: Flash Equilibrium Method for CO2 and H2S Storage in Brine Aquifers with Parallel GPU Implementation. (Advisor: M. Piri; Co-advisor: F. Pereira).
2. Grazione de Souza, Computational Modeling, IPRJ-UERJ, 2008. Thesis: Computational modeling of two and three-phase flows in heterogeneous petroleum reservoirs. (Advisor: F. Pereira; Co-advisor: E. Abreu).
3. Clovis Silva, Computational Modeling, IPRJ-UERJ, 2008. Thesis: A naturally parallelizable algorithm for the computation of equivalent permeability in petroleum reservoirs. (Advisor: F. Pereira; Co-advisor: C. Almeida).
4. Thiago Jordem Pereira, Computational Modeling, IPRJ-UERJ, 2008. Thesis: A new approach for the numerical approximation of the tracer flow problem. (Advisor: F. Pereira; Co-advisor: H. Souto).
5. Sandra Menezes de Carvalho Abreu, Computational Modeling, IPRJ-UERJ, 2005. Thesis: The scale-up problem for two-phase flows in petroleum reservoirs.
6. Sebastian Mancuso, Computational Modeling, IPRJ-UERJ, 2004. Thesis: Approximation of conservation laws by locally conservative Lagrangian schemes.
7. Eduardo Cardoso de Abreu, Computational Modeling, IPRJ-UERJ, 2003. Thesis: Numerical simulation of three-phase flows in petroleum reservoirs.
8. Jose Antonio Oliveira Aquino, Computational Modeling, IPRJ-UERJ, 2003. Thesis: Numerical simulation of the infiltration problem in unsaturated porous media. (Advisor: F. Pereira; Co-advisor: H. Souto).
9. Oscar Gonzalez, Computational Modeling, IPRJ-UERJ, 2001. Thesis: Domain decomposition for the computation of velocity fields in 3D petroleum reservoirs.
10. Idalmis Milian Sardina, Computational Modeling, IPRJ-UERJ, 2000. Thesis: Large scale parabolic problems: software and hardware development.
11. Renata Couto Vista, Computational Modeling, IPRJ-UERJ, 1999. Thesis: Parallel processing in image reconstruction.
12. Luis Carlos Roman, Computational Modeling, IPRJ-UERJ, 1998. Thesis: Numerical simulation of two-phase water-air flows in heterogeneous porous media.

Undergraduate Student Supervision

1. Zach Barr, Applied Mathematics UW, 2013-2014. Project title: Domain Decomposition Methods for Parabolic Problems.
2. Luciana Maroti, Applied Mathematics IPRJ-UERJ, 2005-2006. Project title: Topics in scientific visualisation in petroleum science.
3. Mycon Domingues Lima, Applied Mathematics, IPRJ-UERJ, 2004-2006. Project title: Enhanced oil recovery using WAG strategies.
4. Eder Silva Sales, Applied Mathematics, IPRJ-UERJ, 2004-2006. Project title: Development of an interface for remote access of oil reservoir simulators.
5. Grazione de Souza, Applied Mathematics, IPRJ-UERJ, 2004-2006. Project title: Lagragian Schemes for nonlinear convective problems.
6. Marcele Pinto Marotti, Applied Mathematics, IPRJ-UERJ, 2002-2003. Project title: Topics in scientific visualisation in petroleum science.
7. Diego Roman, Applied Mathematics, IPRJ-UERJ, 2003. Project title: Numerical schemes for hyperbolic conservation laws.
8. Fernanda Povoleri, Applied Mathematics, IPRJ-UERJ, 1998. Project title: Numerical generation of stochastic geology.

Prizes Received (adviser of the projects)

1. Project title: Enhanced oil recovery using WAG strategies. Awarded first place, Beatriz Neves Prize for the best undergraduate project. Student: Maycon Domingues Lima. Prize awarded by the Brazilian Society for Applied Mathematics during its annual congress, 2006.

2. Project title: Development of new strategies for enhanced oil recovery. Awarded first place for the best Ph.D. project in oil recovery, Petrobras Prize for Innovative Technologies. Student: Eduardo Cardoso de Abreu. Prize awarded by Petrobras, 2005.
3. Project title: The scale-up problem for two-phase flows in petroleum reservoirs. Honorary Mention, Guilherme de La Penha Prize for the best M.Sc. thesis. Student: Sandra Menezes de Carvalho Abreu. Prize awarded by the Brazilian Society for Applied Mathematics during its annual congress, 2005.
4. Project title: Numerical approximation of conservation laws by locally conservativeeulerian-lagrangian schemes. Honorary Mention, Guilherme de La Penha Prize for the best M.Sc. thesis. Student: Sebastian Mancuso. Prize awarded by the Brazilian Society for Applied Mathematics during its annual congress, 2004.
5. Project title: Numerical simulation of three-phase water-oil-gas in petroleum reservoirs. Awarded first place, Guilherme de La Penha Prize for the best M.Sc. thesis. Student: Eduardo Cardoso de Abreu. Prize awarded by the Brazilian Society for Applied Mathematics during its annual congress, 2003.

Media Coverage

1. Interview: NATURE, Vol 451, 28, February 2008.

Talks and Invited Presentations

1. Predictive Modeling of Subsurface Flows, *1st IMPA-INTERPORE Workshop in Porous Media,* Rio de Janeiro, RJ, Brazil, October 19-21, 2014 (invited presentation).
2. Multiscale Methods for the Simulation of Subsurface Flows, *Petrobras-University of Sao Paulo Workshop,* Sao Carlos, SP, Brazil, December 14, 2014 (invited presentation).
3. A Bayesian Framework for Rock Characterization: Field Techniques Meet the Lab Scale, *Hess Digital Rock Physics Laboratory Grand Opening*, School of Energy Resources, University of Wyoming (Videos of the invited lectures at: http://www.uwyo.edu/ser/conferences/conferences-past/hess-ceremony.html), 2013 (invited presentation).
4. Invited plenary lecture, Multi-Physics Markov Chain Monte Carlo Methods for Subsurface Flows, I*nternational Conference on Approximation Methods and Numerical Modeling in Environment and Natural Resources (MAMERN'13)*, Granada, Spain, April 22-25, 2013.
5. A Multiscale Mixed Method for Flows in Heterogeneous Porous Media, *University of Granada*, Granada, Spain, April 26, 2013 (invited presentation).
6. A Multiphysics Bayesian Framework for Prediction in Subsurface Flows, Invited colloquium presentation, Department of Petroleum Engineering, Texas A&M University, Nov/13, College Station, TX, 2012.
7. Multiscale Experimentation, Modeling and Numerical Simulation of Subsurface Flows, presentation prepared for the Board of Trustees of UW, Nov/20/2012, Wyoming Union.
8. Quantification of uncertainty in permeability and porosity for predictive simulations of subsurface flows, *10th World Congress in Computational Mechanics (WCCM 2012)*, July 8-13, 2012, Hotel Transamerica, Sao Paulo, SP, Brazil, 2012.
9. Quantification of uncertainty in permeability and porosity for predictive simulations of subsurface flows, *4th International Conference on Porous Media & Annual Meeting of the International Society for Porous Media*, May 14-16, 2012, Purdue University, West Lafayette, Indiana, USA
10. Multi-Physics Markov Chain Monte Carlo Methods for Prediction in Subsurface Flows, *5th LNCC meeting on Computational Modeling*, July 16-19, LNCC, Petropolis, RJ, Brazil, 2012.
11. Keynote lecture, Multi-Stage Markov Chain Monte Carlo Methods for Porous Media Flows, at *the1st International Symposium on Uncertainty Quantification and Stochastic Modeling (Uncertainties 2012)*, Feb/26-Mar/02, Maresias, Sao Sebastiao, SP, Brazil, 2012.
12. A Multiscale Mixed Method for Porous Media Flows, *MAMERN11: 4th International Conference on Approximation Methods and Numerical Modeling in Environmental and Natural Resources*, Saidia (Morocco), May 23-26, 2011 (invited presentation).
13. A New Multiscale Mixed Method for Porous Media Flows, *SIGER (Petrobras) Workshop on Geomechanics and Numerical Methods for Oil Reservoir Simulation***,** LNCC, Petropolis (Brazil), June 20-22, 2011 (invited presentation).

14. A Multiscale Mixed Method for Porous Media Flows, at the *International Conference on Mathematical Modeling in Industry*, Sao Paulo, Brazil, Nov/30-Dec/02/2011.
15. A Multiscale Mixed Method for Porous Media Flows, *2nd Joint Meeting of INCT/Mathematics and INCT/Climate Change: Modeling of CO2 storage in the pre-salt*, LNCC, August 04, Petropolis, RJ, Brazil.
16. Kickoff meeting of the DOE funded project, "Task 6: Development of the UW-team Simulator"; University of Wyoming, SER, 2010.
17. Energy Resources Council Meeting, "Progress Report on the Center for Fundamentals of Subsurface Flow", Hilton Garden Inn, Laramie, 2010.
18. NCAR/UW retreat, "Modeling and Numerical Simulation of Subsurface Flows", Hilton Garden Inn, Laramie, 2010.
19. SER Research Mini-Symposium, "Multiphase Flows in Multiscale Porous Media", University of Wyoming, SER, 2010.
20. Multiphase Flows in Multiscale Porous Media. Workshop in Computational Modeling, Federal University of Juiz de Fora, Juiz de Fora, Brazil, August 17-18, 2009 (Invited).
21. Computational Modeling of the Injection of CO2 in Brine Aquifers. Brazilian Applied Mathematics Meeting (CNMAC), Cuiabá, Brazil, September 8-11, 2009 (Invited plenary presentation).
22. Central Schemes for Multiphase Flows, SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS09), June 14-19, 2009, Leipzig, Germany.
23. Approximation of Multiphase Flows by Central Schemes. Mini-symposium "Numerical Modeling of CO2 Geological Storage", Organizer: Anthony Michel (IFP), at the "3th International Conference on Approximation Methods and Numerical Modeling in Environment and Natural Resources (MAMERN)", June 8-11, 2009, Pau, France (Invited).
24. Center for Fundamentals of Subsurface Flows. Meeting with SER's Energy Resource Council, November 20, 2009, Hilton Inn, Laramie, WY.
25. Multiscale modeling and numerical simulation of injection of CO2 in brine aquifers, University of Wyoming Carbon Sequestration Meeting on October 28-29, 2009, Hilton Inn, Laramie, WY.
26. Subsurface Flow Initiatives: Department of Mathematics, October, 2008, School for Energy Resources, University of Wyoming.
27. Multiscale Modeling and Numerical Simulation of CO2 Injection,September, 2008, DOE carbon kick-off meeting, University of Wyoming.
28. A CFL-Free Lagrangian Approximation Scheme for Nonlinear Conservation Laws, August, 2007, X Workshop on Partial Differential Equations: Theory, Computation and Applications, IMPA, Rio de Janeiro, Brazil.
29. Multiphase Flows in Multiscale Petroleum Reservoirs, July, 2007, International Workshop on Computational Methods and Applications in Geosciences, Xian Jiaotong University, Xian, China (Invited).
30. A CFL-Free Lagrangian Approximation Scheme for Nonlinear Conservation Laws, July, 2007, Inaugural Conference on Computational Methods in Energy and Environmental Research, Peking University, Beijing, China.
31. Multiphase Flows in Multiscale Petroleum Reservoirs, April, 2007, Department of Mathematics, University of Wyoming. (Invited)
32. The Scale-up Problem for Multiphase Flows in Petroleum Reservoirs, August 2006, University of Vicosa Workshop in Mathematics, Vicosa, MG, Brazil (Invited).
33. The Scale-up Problem for Tracer Flows in Petroleum Reservoirs, March 2006, Petrobras/University of Brasilia Workshop in Petroleum Sciences, Brasilia, DF, Brazil. (Invited)
34. Scaling Analysis for Tracer Flows in Petroleum Reservoirs, March 2006, ICAM (International Congress on the Applications of Mathematics), UMALCA/SIAM, Santiago, Chile (Invited).
35. Numerical Simulation of Three-phase Flows in Petroleum Reservoirs, October 2005, Mathematics Department, Purdue University, W. Lafayette, IN, USA (Invited).
36. Scaling Analysis for the Tracer Flow Problem, June 2005, SIAM Geosciences Meeting, Avignon, France.
37. Multiphase Flows in Porous Media: Multiscale Modeling and Simulation, December 2004, VII Meeting on Computational Modeling, Nova Friburgo, RJ, Brazil.
38. Development of Human Resources in Mathematics to Work in the Oil Industry, November 2004, Workshop CGEE/IMPA/SBM (Brazilian Mathematical Society). Brasilia, DF, Brazil.

39. Multiphase Flows in Multiscale Porous Media, September 2004, XXVII Brazilian Applied Mathematics Meeting, Porto Alegre, RS, Brazil. (Opening Invited Presentation)
40. Contaminant Transport in Unsaturated Heterogeneous Formations, August 2004, 1st LNCC Meeting on Computational Modeling, LNCC, Petropolis, RJ, Brazil.
41. Three-phase Flow in Petroleum Reservoirs, August 2004, 1st LNCC Meeting on Computational Modeling, LNCC, Petropolis, RJ, Brazil.
42. Numerical Simulation of Three-phase Flows in Heterogeneous Formations. The University at Stony Brook, Conference on Analysis, Modeling and Computation of PDE and Multiphase Flow, dedicated to J. Glimm's 70th Birthday, August 2004, Stony Brook, USA.
43. Operator Splitting for Three-phase Flows in Petroleum Reservoirs, VIII Workshop on Partial Differential Equations: Theory, Computations and Applications, July 2003, IMPA, Rio de Janeiro, RJ, Brazil.
44. The Significance of decoupling for the scale-up problem for two-phase flow, VI Workshop on Computational Methods for Oceanic, Atmospheric and Groundwater Flows, May 2003, LNCC/MCT, Petropolis, RJ, Brazil.
45. Recent Results on the Scale-up Problem for Two-Phase Flow in Porous Media, VII Workshop on Partial Differential Equations: Theory, Computations and Applications, July 2001, IMPA, Rio de Janeiro, RJ, Brazil.
46. Mixing Regimes and Decoupling for Two-Phase Flow in Heterogeneous Formations, SIAM Conference on Computational and Mathematical Issues in the Geosciences, 2001, Boulder, CO, USA.
47. The Scale-up Problem in Petroleum Science, April 2001, Regional Applied Mathematics Meeting (ERMAC), Federal University of Uberlandia, Uberlandia, MG, Brazil.
48. The Scale Up Problem for Incompressible Flow in Petroleum Reservoirs, March 2000, Mathematics Department, Purdue University, W. Lafayette, IN, USA.
49. Locally Conservative Eulerian-Lagrangian Methods for Reservoir Transport Problems, ITLA (3rd Italian-Latinoamerican Conference on Applied and Industrial Mathematics), November 1999, LNCC, Petropolis, RJ, Brazil. (Invited Presentation)
50. Mixing Regimes and the Scale-Up Problem for Nonlinear Transport in Porous Media, V Workshop on Computational Methods for Oceanic, Atmospheric and Groundwater Flows, September 1999, Trento, Italy.
51. The Scale-Up Problem for Porous Media Flow, Istituto di Analise Numerica, September 1999, Pavia, Italy. (Invited Presentation)
52. Mixing Regimes and the Scale-Up Problem for Transport in Oil Reservoirs, VI Workshop on Partial Differential Equations: Theory, Computations and Applications, July 1999, IMPA, Rio de Janeiro, RJ, Brazil.
53. Computational Modeling of Nonlinear Transport in Multiscale Heterogeneous Reservoirs, Workshop on Computational Modeling and Applications, LNCC, July, 1999, Petropolis, RJ, Brazil (Invited Presentation).
54. Nonconservative, Globally Conservative and Locally Conservative Forms of the Modified Method of Characteristics, Fifth SIAM Conference on Computational and Mathematical Issues in the Geosciences, April, 1999, San Antonio, Texas, USA. (Invited Presentation)
55. Multiphase Flow in Heterogeneous Formations, PRONEX workshop. LNCC/CNPq, December, 1998, Petropolis, RJ, Brazil.
56. Numerical Methods for Transport--Dominated Flows in Heterogeneous Porous Media, XII International Conference on Computational Methods in Water Resources XII, June 1998, Creta, Greece.
57. Modelling of Multiscale Processes in Porous Media Flow. Mathematics Department colloquium, Federal University of Rio Grande do Sul, November 1997, Porto Alegre, RS, Brazil. (Invited Presentation)
58. Waterflooding a Naturally Fractured Petroleum Reservoir. III Workshop on Computational Methods for Oceanic, Atmospheric and Groundwater Flows, September 1997, Rio de Janeiro, RJ, Brazil. (Invited Presentation)
59. On the Numerical Simulation of Transport-Dominated Diffusion Processes in Heterogeneous Porous Media. Pan American Workshop in Applied Mathematics, September 1997, Gramado, RS, Brazil. (Invited Presentation)
60. A Conservative Form of the Modified Method of Characteristics. V Workshop on Partial Differential Equations: Theory, Computations and Applications, July 1997, IMPA, Rio de Janeiro, RJ, Brazil.

61. Scaling Laws for Fluid Mixing in Multiscale Heterogeneous Porous Media. January 1997, Civil Eng. Dept., Purdue University, W. Lafayette, IN, USA.
62. Computational Stochastic Modeling of Multiphase Flow in Heterogeneous Porous Media. Mini-Workshop IPRJ-UERJ, November 1996, Nova Friburgo, RJ, Brazil.
63. Multiscale Flow and Transport. II Workshop on Computational Methods for Oceanic and Atmospheric Flows, October 1996, Trento, Italy.
64. The Modified Method of Characteristics with Adjusted Advection. September 1996, Congresso Nacional de Matematica Aplicada e Computacional (CNMAC), Goiania, GO, Brazil. (Invited Presentation)
65. Computational Stochastic Modeling: A New Methodology for the Study of Fluid Flow in Heterogeneous Porous Media. September 1996, Congresso Nacional de Matematica Aplicada e Computacional (CNMAC), Goiania, GO, Brazil. (Invited Presentation)
66. On the Numerical Simulation of Waterflooding of Heterogeneous Petroleum Reservoirs. April 1996, Mathematics Dept., Purdue University, W. Lafayette, IN, USA.
67. Computational Stochastic Modeling of Two-Phase Flow in Fractal Porous Media. March 1996, Center for Computational Mathematics, Colorado University at Denver, Denver, CO, USA.
68. Scaling Laws for Multiphase Flow. October 1995, UFV (National University of Vicosa), Minas Gerais, MG, Brazil.
69. Parallel Finite Element Algorithms for Flow in Porous Media.October 1995, CENPES/PETROBRAS, Rio de Janeiro, RJ, Brazil.
70. Parallel Computing and Stochastic Modeling Applied to the Study of Transport in Heterogeneous Porous Formations. August 1995, Colloquia on High Performance Scientific Computation (C3AD), LNCC--CNPq, Rio de Janeiro, RJ, Brazil. (Invited Presentation)
71. Fluid Flow in Heterogeneous Porous Formations. July 1995, CENPES/PETROBRAS, Rio de Janeiro, RJ, Brazil.
72. Two-phase Flow in Fractal Porous Media. IV Workshop on Partial Differential Equations: Theory, Computations and Applications, July 1995, IMPA, Rio de Janeiro, RJ, Brazil.
73. Nonlinear Fluid Flow Mixing in Fractal Formations. Second Workshop on Applications of Science to Reservoir Engeneering, June 1995, Mendoza, Argentina.
74. Applications of High Performance Computing to the Study of Flow in Porous Media. Universidade Nacional de La Plata, June 1995, La Plata, Argentina.
75. Multiphase Flow in Fractal Formations, Part II: Two—phase Immiscible Flow. March 1995, Dept. of Agriculture, Purdue University, W. Lafayette, IN, USA.
76. Multiphase Flow in Fractal Formations, Part I: The Tracer Flow Problem. March 1995, Dept. of Agriculture, Purdue University, W. Lafayette, IN, USA.
77. Stochastic Geology and Fluid Flow in Porous Media: a Numerical Study. Stochastic Numerics Meeting (USA-France), March 1995, W. Lafayette, IN, USA.
78. Reservoir Flow Problems in MIMD Systems. SIAM Conference on Geosciences, February 1995, San Antonio, TX, USA.
79. Parallel Methods for Multiphase Flow. SIAM 1994 Annual Meeting, July 1994, San Diego, CA, USA. (Invited Presentation)
80. A Parallel Iterative Procedure for Flow in Fractured Porous Media. Eleventh Army Conference on Applied Mathematics and Computing, May 1994, Pitsburgh, PA, USA.
81. Domain Decomposition for Immiscible Displacement in Single Porosity Systems. October 1993, Mathematics Dept., Purdue University, W. Lafayette, IN, USA.
82. Numerical Simulation of Tracer Injection in Random Porous Media. July 1993, LNCC--CNPq, Rio de Janeiro, RJ, Brazil.
83. A Parallel Iterative Numerical Algorithm for Immiscible Flow in Naturally Fractured Reservoirs. III Workshop on Partial Differential Equations: Theory, Computations and Applications, July 1993, IMPA, Rio de Janeiro, RJ, Brazil.

Grant review panels

1. Panel reviewer for the Department of Energy's (DOE) Applied Mathematics program for DOE laboratory proposals related to PDE methods. Office of Advanced Scientific Computing Research (ASCR). March 29-30 at the Sheraton Denver Downtown,1550 Court Place, Denver, CO, 2011.
2. Mid-term review of two DOE/SciDAC (ERSP/ASCR) projects addressing fundamental science issues in

subsurface contaminant transport at DOE sites. April/22-23, 2009, National Conference Center in Lansdowne, VA.
3. Office of Advanced Scientific Computing Research (ASCR) of the Office of Science (SC), U.S. Department of Energy (DOE), Applied Mathematics - Computer Science research institutes, June/29-30, 2009, Hilton Washington, DC/Rockville Executive Meeting Center, 1750 Rockville Pike, Rockville, MD.
4. DEPScoRE, University of Wyoming. 14 grant proposals were evaluated.

Departmental service (2008--)

1. Member, Graduate Committee, (2015)
2. Member, "Front range computational science curriculum", Chair: Bryan Shader (2010).
3. Member, Committee for the promotion of Eric Moorhouse to full professor of Mathematics (2010).
4. Chair, Hiring Committee for a Theoretical Ecologist (2008-2009).
5. Teaching evaluation of Long Lee (Mathematics Department), 2008 and 2009.
6. Member of the Hiring Committee: Assistant Professor in Computational Physics (2008).
7. Member of the Hiring Committee: SER Professor in Mathematics (2008).

Visiting scholars (2008--)

1. Dr. Alexandre Francisco from the Federal Fluminense University (State of Rio de Janeiro, Brazil) received a Fulbright Scholarship to visit the Department of Mathematics and work with Prof. Pereira for 4 months (Jan-Apr/2010).
2. Pedro Rodelas (University of Granada, Spain), one month visitor, October, 2012
3. Eduardo Garcia (Brazilian National Lab for Scientific Computing, Brazil) one month visitor, October, 2012
4. Marcio Murad (Brazilian National Lab for Scientific Computing, Brazil) one week visit, May, 2012
5. Marcio Borges (Brazilian National Lab for Scientific Computing, Brazil) one week visit, May, 2012
6. Maicon Correa (UNICAMP, Brazil) one week visit, May, 2012
7. Sidarta Araujo, (Brazilian National Lab for Scientific Computing, Brazil) one week visit, May, 2012

Courses Developed

1. Following a request from SER's Curriculum Committee, in the Fall/2010 Professor Pereira began the development of a three-course sequence in Applied Mathematics/Calculus specially designed to students of the new SER's undergraduate program in Energy Resources Management. The goal of the new sequence of courses is to give Energy Resources Science and other interested students quantitative tools to: (i) formulate problems using Mathematics; (ii) Solve problems in energy science and related areas. The strategy to achieve such goals consists of: (i) establish strong connections to physics (classical mechanics) and other applied sciences; (ii) decrease the emphasis in algebraic manipulations (with respect to traditional calculus courses); (iii) present examples in energy science (SER faculty will be invited to contribute); (iv) make use of software (exel, matlab, etc) to understand new concepts and to solve problems. The first course of the sequence was offered in the Fall/2011 and in the Spring of 2012 both Calculus I and II were being offered. Calculus III class was offered by Professor Pereira in the Fall of 2012 for the first time. Calculus III differs considerably from the usual Calculus III in that partial differential equations and their numerical solution are discussed.

Graduate Student Committees

1. Saeed Ovaysi, PhD, Chemical and Petroleum Engineering. Finish date: 12/01/2010.
2. Allan Leal, MS, Mathematics. Finish date: 11/16/2010.