

# Luan Thach Hoang

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Webpage: <https://www.math.ttu.edu/~lhoang/>

## Education

- 2005 *Ph.D. in Mathematics*  
Texas A&M University, College Station, Texas
- 2000 *M.A. in Mathematics*  
Arizona State University, Tempe, Arizona
- 1997 *B.S. in Mathematics*  
National University, Hochiminh City, Vietnam
- 1997 *B.S. in Information Technology*  
National University, Hochiminh City, Vietnam

## Employment

- 9.2014 – present Texas Tech University, Lubbock, Texas  
*Associate professor*
- 9.2008 – 8.2014 Texas Tech University, Lubbock, Texas  
*Assistant professor*
- 9.2005 – 5.2008 University of Minnesota, Minneapolis, Minnesota  
*Dunham Jackson assistant professor*
- 6.2004 – 12.2004 Texas A&M University, College Station, Texas  
*Teaching assistant*
- 9.2000 – 8.2002 Indiana University, Bloomington, Indiana  
*Associate instructor*
- 9.1998 – 8.2000 Arizona State University, Tempe, Arizona  
*Teaching assistant, research assistant*
- 9.1997 – 8.1998 National University, Hochiminh City, Vietnam  
*Instructor*

## Research Interest

Partial differential equations, fluid dynamics, porous media equations, dynamical systems.

## Publications

48. Luan Hoang, *Asymptotic expansions with subordinate variables for solutions of the Navier–Stokes equations*, 1–40, submitted. Preprint  
DOI: 10.48550/arXiv.2403.03132
47. Luan Hoang, Michael S. Jolly, *Intrinsic expansions in large Grashof numbers for the steady states of the Navier–Stokes equations*, 1–25, submitted. Preprint  
DOI: 10.48550/arXiv.2402.13346

46. Luan Hoang, *A new form of asymptotic expansion for non-smooth differential equations with time-decaying forcing functions*, 1–39, submitted. Preprint  
DOI: 10.48550/arXiv.2309.10949
45. Luan Hoang, Thinh Kieu, *Anisotropic flows of Forchheimer-type in porous media and their steady states*, 1–35, submitted. Preprint  
DOI: 10.48550/arXiv.2306.05316
44. Luan Hoang, *On the finite time blow-ups for solutions of nonlinear differential equations*, 1–29, submitted. Preprint  
DOI: 10.48550/arXiv.2303.10153
43. Luan Hoang, *Behavior near the extinction time for systems of differential equations with sublinear dissipation terms*, 1–22, submitted. Preprint  
DOI: 10.48550/arXiv.2211.17241
42. Luan Hoang, *Asymptotic expansions about infinity for solutions of nonlinear differential equations with coherently decaying forcing functions*, *Annali della Scuola Normale Superiore di Pisa, Classe di Scienze*, Vol. XXV, No. 1 (2024), 311–370.  
DOI: 10.2422/2036-2145.202109\_004
41. Ciprian Foias, Luan Hoang, Michael S. Jolly, *On Galerkin approximations of the Navier-Stokes equations in the limit of large Grashof numbers*, *Communications on Pure and Applied Analysis*, Volume 23, Issue 2 (2024), 269–303.  
DOI: 10.3934/cpaa.2024010
40. Luan Hoang, *The Navier–Stokes equations with body forces decaying coherently in time*, *Journal of Mathematical Analysis and Applications*, Vol. 531, Issue 2, Part 1 (2024), 127863 (39 pages).  
DOI: 10.1016/j.jmaa.2023.127863
39. Luan Hoang, *Long-time behavior of solutions of superlinear systems of differential equations*, *Dynamical Systems*, Vol. 39, No. 1 (2024), 79–107.  
DOI: 10.1080/14689367.2023.2234845
38. Emine Celik, Luan Hoang, Thinh Kieu, *Studying a doubly nonlinear model of slightly compressible Forchheimer flows in rotating porous media*, *Turkish Journal of Mathematics*, *Turkish Journal of Mathematics*, Vol. 47, No. 3 (2023), 949–987.  
DOI: 10.55730/1300-0098.3405
37. Dat Cao, Luan Hoang, Thinh Kieu, *Infinite series asymptotic expansions for decaying solutions of dissipative differential equations with non-smooth nonlinearity*, *Qualitative Theory of Dynamical Systems*, Volume 20, Issue 3 (2021), 62, 38 pp.  
DOI: 10.1007/s12346-021-00502-9
36. Emine Celik, Luan Hoang, Thinh Kieu, *Slightly compressible Forchheimer flows in rotating porous media*, *Journal of Mathematical Physics*, Volume 62 (2021), Issue 7, 073101, 39 pp.  
DOI: 10.1063/5.0047754
35. Dat Cao, Luan Hoang, *Asymptotic expansions with exponential, power, and logarithmic functions for non-autonomous nonlinear differential equations*, *Journal of Evolution Equations*, Volume 21, Issue 2, 1179–1225, 2021.  
DOI: 10.1007/s00028-020-00622-w
34. Luan Hoang, *Asymptotic expansions for the Lagrangian trajectories from solutions of the Navier–Stokes equations*, *Communications in Mathematical Physics*, Volume 383, Issue 2, 981–995 (2021).  
DOI: 10.1007/s00220-020-03863-5

33. Luan Hoang, Edriss Titi, *Asymptotic expansions in time for rotating incompressible viscous fluids*, Annales de l'Institut Henri Poincaré. Analyse Non Linéaire, Volume 38, Issue 1, January–February 2021, 109–137.  
DOI: 10.1016/j.anihpc.2020.06.005
32. Dat Cao, Luan Hoang, *Asymptotic expansions in a general system of decaying functions for solutions of the Navier-Stokes equations*, Annali di Matematica Pura ed Applicata, Vol. 199, No. 3 (2020), 1023–1072.  
DOI: 10.1007/s10231-019-00911-3
31. Dat Cao, Luan Hoang, *Long-time asymptotic expansions for Navier–Stokes equations with power-decaying forces*, Proceedings of the Royal Society of Edinburgh: Section A Mathematics, Vol. 150, No. 2 (2020), 569–606.  
DOI: 10.1017/prm.2018.154
30. Luan Hoang, Thinh Kieu, *Global estimates for generalized Forchheimer flows of slightly compressible fluids*, Journal d'Analyse Mathématique, March 2019, Volume 137, Issue 1, 1–55.  
DOI: 10.1007/s11854-018-0064-5
29. Emine Celik, Luan Hoang, Thinh Kieu, *Doubly nonlinear parabolic equations for a general class of Forchheimer gas flows in porous media*, Nonlinearity, Vol. 31, No. 8 (2018) 3617–3650.  
DOI: 10.1088/1361-6544/aabf05
28. Ciprian Foias, Luan Hoang, Jean-Claude Saut, *Navier and Stokes meet Poincaré and Dulac*, J. Appl. Anal. Comput., Volume 8, Number 3, (June 2018) 727–763. (survey)  
DOI: 10.11948/2018.727
27. Luan Hoang, Vincent Martinez, *Asymptotic expansion for solutions of the Navier-Stokes equations with non-potential body forces*, J. Math. Anal. Appl., Volume 462, Issue 1, (1 June 2018) 84–113.  
DOI: 10.1016/j.jmaa.2018.01.065
26. Emine Celik, Luan Hoang, Thinh Kieu, *Generalized Forchheimer flows of isentropic gases*, J. Math. Fluid Mech., (March 2018) Volume 20, Issue 1, 83–115.  
DOI: 10.1007/s00021-016-0313-2
25. Luan Hoang, Eric Olson, James Robinson, *Continuity of pullback and uniform attractors*, J. Differential Equations, Volume 264, Issue 6, (15 March 2018) 4067–4093.  
DOI: 10.1016/j.jde.2017.12.002
24. Luan Hoang, Thinh Kieu, *Interior estimates for generalized Forchheimer flows of slightly compressible fluids*, Advanced Nonlinear Studies, 17(4), (October 2017) 739–767.  
DOI: 10.1515/ans-2016-6027
23. Luan Hoang, Vincent Martinez, *Asymptotic expansion in Gevrey spaces for solutions of Navier-Stokes equations*, Asymptotic Analysis, (2017), vol. 104, no. 3–4, 167–190.  
DOI: 10.3233/ASY-171429
22. Emine Celik, Luan Hoang, Akif Ibragimov, Thinh Kieu, *Fluid flows of mixed regimes in porous media*, J. Math. Phys., Volume 58 (2017), No. 2, 023102, 30 pp.  
DOI: 10.1063/1.4976195
21. Emine Celik, Luan Hoang, *Maximum estimates for generalized Forchheimer flows in heterogeneous porous media*, J. Differential Equations, Volume 262, Issue 3 (5 February 2017), 2158–2195.  
DOI: 10.1016/j.jde.2016.10.043
20. Luan Hoang, Truyen Nguyen, Tuoc Phan, *Local gradient estimates for degenerate elliptic equations*, Advanced Nonlinear Studies, Volume 16, Issue 3 (Aug 2016), 479–489.  
DOI: 10.1515/ans-2015-5038

19. Emine Celik, Luan Hoang, *Generalized Forchheimer flows in heterogeneous porous media*, *Nonlinearity*, Volume 29, Number 3 (March 2016), 1124–1155.  
DOI: 10.1088/0951-7715/29/3/1124
18. Luan Hoang, Akif Ibragimov, Thinh Kieu, Zeev Sobol, *Stability of solutions to generalized Forchheimer equations of any degree*, *Journal of Mathematical Sciences* (via journal “Problems in Mathematical Analysis”), Volume 210, Number 4 (2015), 476–544.  
DOI: 10.1007/s10958-015-2576-1
17. Luan Hoang, Eric Olson, James Robinson, *On the continuity of global attractors*, *Proc. Amer. Math. Soc.*, Volume 143, Number 10 (2015), 4389–4395.  
DOI: 10.1090/proc/12598
16. Luan Hoang, Truyen Nguyen, Tuoc Phan, *Gradient estimates and global existence of smooth solutions to a cross-diffusion system*, *SIAM Journal on Mathematical Analysis*, *SIAM Journal on Mathematical Analysis*, Volume 47, Issue 3 (2015), 2122–2177.  
DOI: 10.1137/140981447
15. Luan Hoang, Akif Ibragimov, Thinh Kieu, *A family of steady two-phase generalized Forchheimer flows and their linear stability analysis*, *J. Math. Phys.* 55, Issue 12 (2014), 123101, 32 pp.  
DOI: 10.1063/1.4903002
14. Luan Hoang, Thinh Kieu, Tuoc Phan, *Properties of generalized Forchheimer flows in porous media*, “Problems of Mathematical Analysis”, volume 76 (July-August 2014), and in “Journal of Mathematical Sciences”, Vol. 202 No. 2 (October 2014), 259–332.  
DOI: 10.1007/s10958-014-2045-2
13. Luan Hoang, *Incompressible fluids in thin domains with Navier friction boundary conditions (II)*, *Journal of Mathematical Fluid Mechanics*, Volume 15, Issue 2, (June 2013) 361–395.  
DOI: 10.1007/s00021-012-0123-0
12. Luan Hoang, Akif Ibragimov, Thinh Kieu, *One-dimensional two-phase generalized Forchheimer flows of incompressible fluids*, *J. Math. Anal. Appl.*, Volume 401, Issue 2, (May 2013) 921–938.  
DOI: 10.1016/j.jmaa.2012.12.055
11. Luan Hoang, Akif Ibragimov, *Qualitative study of generalized Forchheimer flows with the flux boundary condition*, *Advances in Differential Equations*, Volume 17, Numbers 5-6, (May/June 2012) 511–556.  
<https://projecteuclid.org/euclid.ade/1355703078>
10. Ciprian Foias, Luan Hoang, Jean-Claude Saut, *Asymptotic integration of Navier-Stokes equations with potential forces. II. An explicit Poincaré-Dulac normal form*, *Journal of Functional Analysis*, Vol. 260, Issue 10 (2011), 3007–3035.  
DOI: 10.1016/j.jfa.2011.02.005
9. Luan Hoang, Akif Ibragimov, *Structural stability of generalized Forchheimer equations for compressible fluids in porous media*, *Nonlinearity*, Volume 24, Number 1 (January 2011) 1–41.  
DOI: 10.1088/0951-7715/24/1/001
8. Luan Hoang, George R Sell, *Navier–Stokes equations with Navier boundary conditions for an oceanic model*, *Journal of Dynamics and Differential Equations*, Volume 22, Number 3 (September 2010), 563–616.  
DOI: 10.1007/s10884-010-9189-7
7. Luan Hoang, *Incompressible fluids with Navier friction boundary conditions in thin domains (I)*, *Journal of Mathematical Fluid Mechanics*, Volume 12, Number 3 (August 2010), 435–472.  
DOI: 10.1007/s00021-009-0297-2

6. Eugenio Aulisa, Lidia Bloshanskaya, Luan Hoang, Akif Ibragimov, *Analysis of generalized Forchheimer equations of compressible fluids in porous media*, Journal of Mathematical Physics 50, Issue 10, (2009), 103102, 44 pp.  
DOI: 10.1063/1.3204977
5. Ciprian Foias, Luan Hoang, Basil Nicolaenko, *On the helicity in 3D Navier–Stokes equations II: The statistical case*, Communications in Mathematical Physics, Volume 290, Issue 2 (2009), 679–717.  
DOI: 10.1007/s00220-009-0827-z
4. Ciprian Foias, Luan Hoang, Eric Olson, Mohammed Ziane, *The normal form of the Navier–Stokes equations in suitable normed spaces*, Annales de l’Institut Henri Poincaré - Analyse Non Linéaire, Volume 26, Issue 5 (September–October 2009), 1635–1673.  
DOI: 10.1016/j.anihpc.2008.09.003
3. Luan Hoang, *A basic inequality for the Stokes operator related to the Navier boundary condition*, Journal of Differential Equations, Volume 245, Issue 9 (November 2008), 2585–2594.  
DOI: 10.1016/j.jde.2008.01.024
2. Ciprian Foias, Luan Hoang, Basil Nicolaenko, *On the helicity in 3D Navier–Stokes equations I: The non-statistical case*, Proceedings of the London Mathematical Society, Volume 94 Part 1 (January 2007) 53–90.  
DOI: 10.1112/plms/pd1003
1. Ciprian Foias, Luan Hoang, Eric Olson, Mohammed Ziane, *On the solutions to the normal form of the Navier–Stokes equations*, Indiana University Mathematics Journal, Vol. 55, No 2 (2006) 631–686.  
DOI: 10.1512/iumj.2006.55.2830

## Funding

- 2014–2017      Title: *Nonlinear Couplings for Flows in Fractured Porous Media: Analysis and Numerical Algorithms*  
Agency: NSF - Applied Mathematics  
Amount: \$290,001.00  
Role: Co-principal investigator  
Status: **Funded, DMS 1412796**
- 2009–2012      Title: *Analysis of non-linear flows in heterogeneous porous media and applications*  
Agency: NSF - Applied Mathematics  
Amount: \$221,626  
Role: Co-principal investigator  
Status: **Funded, DMS 0908177**
- 2009              Title: *Mini-Symposium on Nonlinear Analysis, PDE, and Applications*  
Agency: NSF - Applied Mathematics  
Amount: \$15,000  
Role: Principal investigator  
Status: **Funded, DMS 0931596**

## Conferences

- 2.2022              Workshop “Quasi-linear PDEs in Fluid II”  
Virtual, jointly organized by Japan, Korea, U.S., February 20 – 21, 2022  
INVITED TALK: *Open problems in asymptotic expansions for viscous incompressible fluids*

- 9.2021                   The 44th SIAM Southeastern Atlantic Section Conference  
 Auburn University, Auburn, Alabama, September 18-19, 2021  
 INVITED TALK: *Infinite series asymptotic expansions for solutions of dissipative nonlinear differential equations*
- 7.2021                   Saigon Summer Meeting 2021  
 Online, July 24-25, 2021  
 INVITED TALK: *Large time asymptotic behaviors of fluids in the Eulerian and Lagrangian formulations*
- 1.2021                   2021 Joint AMS-MAA Mathematics Meeting  
 January 6-9, 2021  
 INVITED TALK: *Asymptotic expansions for decaying solutions of dissipative differential equations*
- 9.2020                   AMS 2020 Fall Central Sectional Meeting  
 September 12-13, 2020.  
 INVITED TALK: *Asymptotic expansions for the Lagrangian trajectories from solutions of the Navier-Stokes equations*
- 10.2019                 AMS 2019 Fall Eastern Sectional Meeting  
 Binghamton University, Binghamton, New York, October 12-13, 2019  
 INVITED TALK: *Asymptotic expansions for rotating incompressible viscous fluids*
- 10.2018                 The 4th Annual Meeting of SIAM Central States Section  
 Norman, Oklahoma, October 5-7, 2018  
 INVITED TALK: *Developments in asymptotic expansions for solutions of Navier-Stokes equations*
- 1.2017                   2017 Joint Mathematics Meeting  
 Atlanta, Georgia, January 4-7, 2017  
 INVITED TALK: *Asymptotic expansion for solutions of Navier-Stokes equations with a non-potential body force*
- 7.2016                   The 11th AIMS Conference on Dynamical Systems, Differential Equations  
 and Applications  
 Orlando, Florida, July 1-5, 2016  
 INVITED TALK: *Global existence of smooth solutions to the SKT system in high dimensional spaces*
- 5.2016                   International Conference on Evolution Equations in conjunction with the  
 31st annual Shanks Lecture  
 Vanderbilt University, Nashville, TN, May 16-20, 2016  
 INVITED TALK: *Asymptotic expansion for solutions of Navier-Stokes equations with a non-potential body force*
- 5.2016                   46th Annual John H. Barrett Memorial Lectures  
 University of Tennessee, Knoxville, TN, May 16-18, 2016  
 INVITED TALK: *Regular solutions of the SKT system in any dimensions*
- 3.2016                   The 40th SIAM Southeastern Atlantic Section Conference (SIAM-SEAS).  
 Applied Mathematics  
 University of Georgia, Athens, Georgia, March 12-13, 2016  
 INVITED TALK: *Asymptotic expansion for solutions of Navier-Stokes equations*

- 1.2016                    2016 Joint Mathematics Meeting  
Seattle, Washington, January 6-9, 2016  
INVITED TALK: *On non-Darcy fluid flows in porous media*
  
- 12.2015                    SIAM Conference on Analysis of Partial Differential Equations  
Scottsdale, Arizona, December 7-10, 2015  
TALK: *Continuity of attractors for dynamical systems*
  
- 4.2015                    AMS 2015 Spring Western Sectional Meeting  
Las Vegas, NV, April 18-19, 2015  
INVITED TALK: *On the normal form of Navier-Stokes equations in Gevrey spaces*
  
- 7.2014                    The 10th AIMS Conference on Dynamical Systems, Differential Equations  
and Applications  
Madrid, Spain, July 7-11, 2014  
INVITED TALK: *Estimates in  $W^{1,\infty}$  for generalized Forchheimer equations  
in porous media*
  
- 6,7.2014                    Advances in Mathematical Fluid Mechanics, Stochastic and Deterministic  
Methods  
Lisbon, Portugal, June 30-July 5, 2014  
INVITED TALK: *On two-phase Forchheimer flows of incompressible fluids*
  
- 4.2014                    AMS 2014 Spring Central Sectional Meeting  
Texas Tech University, Lubbock, TX, April 11-13, 2014  
INVITED TALK: *Derivative estimates for generalized Forchheimer flows*
  
- 12.2013                    SIAM conference on Analysis of Partial Differential Equations  
Lake Buena Vista, Florida, December 7-10, 2013  
INVITED TALK: *On dynamics of fluid flows in porous media*
  
- 10.2012                    AMS 2012 Fall Western Section Meeting  
University of Arizona, Tucson, AZ, October 27-28, 2012  
INVITED TALK: *The Stokes operator for an interface boundary value problem  
in two-layer domains*
  
- 10.2012                    AMS 2012 Central Fall Section Meeting  
University of Akron, Akron, OH, October 20-21, 2012  
INVITED TALK: *Generalized Forchheimer equations for slightly compressible  
fluids*
  
- 7.2012                    The 9th AIMS Conference on Dynamical Systems, Differential Equations  
and Applications  
Orlando, Florida, July 1-5, 2012  
INVITED TALK: *A Poincaré–Dulac normal form for Navier–Stokes equa-  
tions*
  
- 11.2011                    SIAM Conference on Analysis of Partial Differential Equations  
San Diego, CA, November 14-17, 2011  
INVITED TALK: *Navier–Stokes equations in thin two-layer domains with  
non-flat boundaries*  
INVITED TALK: *Analysis of non-Darcy compressible flows in porous media*
  
- 3.2011                    34th Annual Texas Differential Equations Conference  
University of Texas-Pan American, Edinburg, TX, March 26-27, 2011  
INVITED TALK: *Dynamics and Stabilities of Generalized Forchheimer Flows  
in Porous Media*

- 4.2010           AMS 2010 Fall Western Section Meeting  
 Los Angeles, CA, October 9-10, 2010  
 INVITED TALK: *Structural stability of nonlinear flows in porous media*
- 4.2009           AMS 2009 Spring Western Section Meeting  
 San Francisco, CA, April 25-26, 2009  
 INVITED TALK: *Generalized Forchheimer equations in porous media*
- 5.2008           The 7th AIMS International Conference on Dynamical Systems and Differential Equations  
 Arlington, TX, May 18-21, 2008  
 INVITED TALK: *Problems in oceanic dynamics and climate modeling*
- 12.2007          SIAM Conference on Analysis of Partial Differential Equations  
 Mesa, AZ, December 10-12, 2007  
 INVITED TALK: *Incompressible fluids in thin domains with Navier friction boundary conditions*
- 11.2007          Nonlinear Dynamics and PDE Mini-Conference  
 Arizona State University, Tempe, AZ, November 19-20, 2007  
 INVITED TALK: *Navier–Stokes equations: the normalization map, statistical solutions and fluid dynamics*
- 11.2007          AMS 2007 Fall Southeastern Meeting  
 Murfreesboro, TN, November 3-4, 2007  
 INVITED TALK: *Global strong solutions of equations in geophysical fluid dynamics*
- 5.2007           The 3rd Symposium on Analysis & PDEs  
 Purdue University, West Lafayette, IN, May 27-30, 2007  
 CONTRIBUTED TALK: *Regularity of the Stokes operator in thin domains*
- 5.2007           US–Chile Workshop on New Developments in Partial Differential Equations I  
 Carnegie Mellon University, Pittsburgh, PA, May 21-24, 2007  
 CONTRIBUTED TALK: *Navier–Stokes equations with Navier boundary conditions in nearly flat domains*
- 3.2007           AMS 2007 Spring Central Section Meeting  
 Oxford, OH, March 16-17, 2007  
 INVITED TALK: *Statistical solutions to the Navier–Stokes equations and long time behaviors of fluid flows*
- 3.2007           AMS 2007 Spring Southeastern Section Meeting  
 Davidson, NC, March 3-4, 2007  
 INVITED TALK: *Studying the normal form of the Navier–Stokes equations in suitable Banach spaces*
- 3.2005           AMS 2005 Spring Southeastern Sectional Meeting  
 Bowling Green, KY, March 18-19  
 INVITED TALK: *On the solutions to the normal form of the Navier–Stokes Equations*
- 12.2004          SIAM Conference on Analysis of Partial Differential Equations  
 Houston, TX, December 6-8, 2004  
 INVITED TALKS: *On the convergence of the asymptotic expansions of the regular solutions to the 3D-periodic Navier–Stokes equations and applications to asymptotic behavior of helicity. Parts I and II.*



- 4.2004 AMS 2004 Spring Western Section Meeting  
Los Angeles, CA, April 3-4  
INVITED TALK: *On the helicity in 3D Navier–Stokes equations*

## Seminars and Colloquia

- 11.2023 V. I. Smirnov Seminar on Mathematical Physics  
St. Petersburg Department of Steklov Mathematical Institute  
INVITED TALK: *Complicated asymptotic expansions for the Navier–Stokes equations*
- 9.2023 Analysis Seminar  
Department of Mathematics and Statistics, Texas Tech University  
INVITED TALK: *On the finite time extinction for nonlinear differential equations (Part II)*
- 9.2023 Analysis Seminar  
Department of Mathematics and Statistics, Texas Tech University  
INVITED TALK: *On the finite time extinction for nonlinear differential equations (Part I)*
- 4.2023 SIAM Student Chapter Meeting  
Department of Mathematics, University of North Georgia  
INVITED TALK: *Behavior near the extinction time for systems of differential equations with sublinear dissipation terms*
- 3.2023 PDE Seminar  
Department of Mathematics, Indiana University  
INVITED TALK: *Asymptotic expansions for solutions of the Navier–Stokes equations with body forces decaying coherently in time*
- 1.2023 Analysis Seminar  
Department of Mathematics and Statistics, Texas Tech University  
INVITED TALK: *Long-time behavior of solutions of superlinear systems of differential equations*
- 9.2022 Analysis Seminar  
Department of Mathematics and Statistics, Texas Tech University  
INVITED TALK: *The Navier–Stokes equations with body forces decaying coherently in time*
- 3.2022 Analysis Seminar  
Department of Mathematics and Statistics, Texas Tech University  
INVITED TALK: *A doubly nonlinear model of slightly compressible Forchheimer flows in rotating porous media*
- 10.2021 Analysis Seminar  
Department of Mathematics and Statistics, Texas Tech University  
INVITED TALK: *Asymptotic expansions about infinity for solutions of nonlinear differential equations with coherently decaying forcing functions*
- 9.2021 PDE Seminar  
Department of Mathematics  
University of Tennessee, Knoxville  
INVITED TALK: *Asymptotic analysis for viscous, incompressible fluids*

- 2.2021                    Analysis Seminar  
 Department of Mathematics and Statistics, Texas Tech University  
 INVITED TALK: *Infinite series asymptotic expansions for dissipative differential equations with non-smooth nonlinearity*
- 1.2021                    Nonlinear PDEs Seminar,  
 Department of Mathematics, Texas A&M University  
 INVITED TALK: *The Navier-Stokes equations: asymptotic expansions for solutions and their associated Lagrangian trajectories*
- 10.2020                  Applied Mathematics Seminar  
 Department of Mathematics and Statistics, Hunter College  
 INVITED TALK: *Long-time asymptotic expansions for viscous incompressible fluid flows*
- 9.2020                    Analysis Seminar  
 Department of Mathematics and Statistics, Texas Tech University  
 INVITED TALK: *Asymptotic analysis of the Lagrangian trajectories from solutions of the Navier-Stokes equations*
- 3.2020                    Analysis Seminar  
 Department of Mathematics and Statistics, Texas Tech University  
 INVITED TALK: *Asymptotic expansions for solutions of the Navier–Stokes–Boussinesq equations. Parts I & II*
- 9&10.2019                Analysis Seminar  
 Department of Mathematics and Statistics, Texas Tech University  
 INVITED TALK: *Slightly Compressible Forchheimer Flows in Rotating Porous Media. Parts I & II*
- 4.2019                    Analysis Seminar  
 Department of Mathematics and Statistics, Texas Tech University  
 INVITED TALK: *Asymptotic expansions for decaying solutions of ODEs. Parts I & II*
- 11.2018                  Analysis Seminar  
 Department of Mathematics and Statistics, Texas Tech University  
 INVITED TALK: *Asymptotic expansions in time for solutions of Navier-Stokes equations of rotating fluids*
- 9.2018                    Colloquium  
 Department of Mathematics and Statistics, Texas Tech University  
 TALK: *Analysis of Navier-Stokes systems and Forchheimer flows*
- 3.2018                    Analysis Seminar  
 Department of Mathematics and Statistics, Texas Tech University  
 INVITED TALK: *Asymptotic expansions in Gevrey spaces for solutions of Navier-Stokes equations in periodic domains*
- 2.2018                    Analysis Seminar  
 Department of Mathematics and Statistics, Texas Tech University  
 INVITED TALK: *Gevrey classes and the Navier-Stokes equations. Part II*
- 12.2017                  Differential Equations Seminar  
 Department of Mathematics and Statistics, University of Maryland Baltimore County  
 INVITED TALK: *Studying nonlinear fluid flows in heterogeneous porous media*

- 11.2017            Analysis Seminar  
Department of Mathematics and Statistics, Texas Tech University  
INVITED TALK: *Gevrey classes and the Navier-Stokes equations*
  
- 11.2017            Joint PDEs and Mathematical Physics Seminar,  
Department of Mathematics, Texas A&M University  
INVITED TALK: *Large-time asymptotic expansions for solutions of Navier-Stokes equations*
  
- 11.2017            Colloquium  
Department of Mathematics, University of North Georgia  
INVITED TALK: *Asymptotic expansions in large time for solutions of non-autonomous differential equations*
  
- 10.2017            Differential Equations and Applied Math Seminar,  
Department of Mathematics, University of Louisville  
INVITED TALK: *Foias-Saut expansions for solutions of nonlinear differential equations*
  
- 9.2017             Seminar  
Institute for Scientific Computing and Applied Mathematics, Indiana University  
INVITED TALK: *Asymptotic expansions of Foias-Saut type for Navier-Stokes equations with decaying non-potential forces*
  
- 9.2017             Differential Equations Seminar  
Department of Mathematics, University of Tennessee  
INVITED TALK: *Foias-Saut asymptotic expansions for solutions of Navier-Stokes equations with time-dependent forces*
  
- 3.2017             Analysis Seminars  
Department of Mathematics and Statistics, Texas Tech University  
INVITED TALK: *Models and analysis of fluid flows in heterogeneous porous media* (2 lectures)
  
- 12.2016            Colloquium  
Department of Mathematics and Statistics, University of Maryland, Baltimore County  
INVITED TALK: *On the theory of asymptotic expansions and normal form for Navier-Stokes equations*
  
- 2.2016             Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Continuity of global, pullback and uniform attractors*
  
- 9.2015             Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Global estimates for generalized Forchheimer flows of slightly compressible fluids* (2 lectures)
  
- 9.2014             Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Analysis of single and multi phase flows in porous media* (3 lectures)
  
- 6.2014             Analysis & PDEs Seminar  
Warwick Mathematics Institute, University of Warwick  
TALK: *Single and multi phase Forchheimer flows in porous media*

- 4.2014 Bio-Math Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Global solutions of the Shigesada-Kawasaki-Teramoto system*
- 10.2013 Colloquium  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Non-linear Problems in Fluid Dynamics*
- 9.2013 Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *L-infinity estimates for generalized Forchheimer flows*
- 3.2013 Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Generalized Forchheimer equations for porous media: Part V*
- 4.2012 Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *An interface boundary value problem for incompressible fluids in two-layer domains* (2 lectures)
- 10.2011 Colloquium  
Department of Mathematics, University of Tennessee, Knoxville  
TALK: *Navier–Stokes equations and geophysical fluid dynamics*
- 8&9.2011 Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Forchheimer equations in porous media - Part IV* (2 lectures)
- 4.2011 CAMP/Nonlinear PDEs Seminar  
Department of Mathematics, University of Chicago  
INVITED TALK: *An explicit Poincaré–Dulac normal form for Navier–Stokes equations*
- 2.2011 Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *An explicit Poincaré–Dulac normal form for Navier–Stokes equations*
- 9.2010 PDE/Applied Math Seminar  
Department of Mathematics, Indiana University  
INVITED TALK: *An explicit Poincaré–Dulac normal form for Navier–Stokes equations*
- 9.2010 Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Forchheimer equations in porous media - Part III* (2 lectures)
- 9.2009 Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Forchheimer equations in porous media - Part II*
- 3.2009 Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Forchheimer equations in porous media - Part I*

- 9.2008 Applied Mathematics Seminars  
Department of Mathematics and Statistics, Texas Tech University  
TALK: *Navier-Stokes equations in thin domains with Navier friction boundary conditions*, Parts I and II
- 10.2007 Institute Seminar  
Department of mathematics, Indiana University  
INVITED TALK: *Global strong solutions of equations in geophysical fluid dynamics*
- 4.2007 PDE and Dynamical Systems Seminars  
School of Mathematics, University of Minnesota  
TALK: *Navier-Stokes equations with Navier boundary conditions in nearly flat domains*
- 4.2007 PDE Seminar  
School of Mathematics, University of Minnesota  
TALK: *The normal form of the Navier-Stokes equations in suitable normed spaces*
- 12.2006 PDE and Dynamical Systems Seminars  
School of Mathematics, University of Minnesota  
TALK: *On the Stokes and Laplacian operators in Navier-Stokes equations*
- 11.2005 Colloquium  
Department of Mathematics, University of Nevada  
INVITED TALK: *Asymptotic behavior of statistical solutions to the Navier-Stokes equations*
- 10.2005 PDE Seminar  
School of Mathematics, University of Minnesota  
TALK: *Normalization maps and statistical solutions in Navier-Stokes equations*
- 10.2005 Dynamical Systems Seminar  
School of Mathematics, University of Minnesota  
TALK: *A normal form for the Navier-Stokes equations*
- 4.2005 PDE and Dynamical System Seminars  
School of Mathematics, University of Minnesota  
INVITED TALK: *Asymptotic analysis of the helicity in 3D periodic Navier-Stokes equations*
- 1.2005 Applied Mathematics Seminar  
Department of Mathematics, Texas A&M University  
TALK: *On the solutions to the normal form of the Navier-Stokes Equations*
- 3.2004 Applied Mathematics Seminar  
Department of Mathematics, Texas A&M University  
TALK: *On the helicity in 3D Navier-Stokes equations*

## Organizing Work

- 7.2024 (Proposed) Co-organizer of minisymposium (3 sessions) *Recent developments in the study of fluids*  
2024 SIAM Annual Meeting  
Spokane, Washington July 8-12, 2024

- 7.2016 Co-organizer of special session (SS108) *New Developments in Porous Media*  
The 11th AIMS Conference on Dynamical Systems, Differential Equations  
and Applications  
Orlando, Florida, July 1-5, 2016
- 12.2015 Co-organizer of Mini-symposium *Dynamics of Partial Differential Equations*  
SIAM Conference on Analysis of Partial Differential Equations  
Scottsdale, Arizona, December 7-10, 2015
- 4.2014 Co-organizer of Special Session: *Navier-Stokes Equations and Fluid Dynamics*  
AMS 2014 Spring Central Sectional Meeting  
Texas Tech University, Lubbock, TX, April 11-13, 2014
- 12.2013 Co-organizer of Mini-Symposium: *Elliptic and Parabolic Equations with Nonstandard Nonlinearity*  
SIAM conference on Analysis of Partial Differential Equations  
Lake Buena Vista, Florida, December 7-10, 2013
- 10.2013 Co-organizer of *The 13th Red Raider Mini-Symposium*, Department of  
Mathematics and Statistics, Texas Tech University, October 25-26, 2013
- 6.2013 Co-organizer of Mini-Symposium: *Dynamics of Non-linear Flows in Porous Media: Analysis and Applications*  
SIAM Conference on Mathematical and Computational Issues in the Geosciences  
University of Padova, Italy, June 17-20, 2013
- 11.2011 Co-organizer of Mini-Symposium: *Partial Differential Equations for Non-linear Processes in Porous Media*  
SIAM Conference on Analysis of Partial Differential Equations  
San Diego, CA, 11.November 14-17, 2011
- 10.2009 Co-organizer of *The 9th Red Raider Mini-Symposium*, Department of  
Mathematics and Statistics, Texas Tech University, October 29-31, 2009

### Conferences and Workshops Attended

- 4.2023 Workshop: Degeneracy of Algebraic Points (Diophantine Geometry Program)  
Mathematical Sciences Research Institute (MSRI)  
Berkeley, CA, April 24–28, 2023
- 10.2009 AMS 2009 Fall Central Section Meeting  
Waco, TX, October 16-18, 2009
- 7.2009 Summer Program: Nonlinear Conservation Laws and Applications  
Institute for Mathematics and Applications  
Minneapolis, MN, July 13-31, 2009

### Visits

- 3.2023 Department of Mathematics, Indiana University
- 6.2014 Mathematics Institue, Uninersity of Warwick

### Editorialship

- 5.2022 – present Member of the editorial board of Sakarya University Journal of Science (SAUJS)

## Teaching Experience

- Texas Tech University, Lubbock, Texas
  - Spring 2024* MATH5099-007. Partial Differential Equations II
  - Spring 2024* MATH4354-001. Differential equations II
  - Fall 2023* MATH5332-001. Partial Differential Equations I
  - Fall 2023* MATH4354-001. Differential equations II
  - Fall 2022* MATH 5099-007. Methods in Partial Differential Equation
  - Spring 2022* MATH3350-012. Higher Mathematics for Engineers and Scientists I
  - Spring 2022* MATH3350-111. Higher Mathematics for Engineers and Scientists I
  - Fall 2021* MATH2450-011. Calculus III with Applications
  - Fall 2021* MATH2450-013. Calculus III with Applications
  - Spring 2021* MATH2450-002. Calculus III with Applications
  - Spring 2021* MATH2450-D01. Calculus III with Applications
  - Fall 2020* MATH3351-001. Higher Mathematics for Engineers and Scientists II
  - Fall 2020* MATH2450-011. Calculus III with Applications
  - Spring 2020* MATH3350-022. Higher Mathematics for Engineers and Scientists I
  - Spring 2020* MATH3350-021. Higher Mathematics for Engineers and Scientists I
  - Fall 2019* MATH4351-001. Advanced Calculus II
  - Fall 2019* MATH2450-022. Calculus III With Applications
  - Spring 2019* MATH5332-001. Partial Differential Equations I.
  - Spring 2019* MATH4354-002. Differential equations II
  - Fall 2018* MATH3354-002. Differential equations I
  - Fall 2018* MATH3351-002. Higher Mathematics for Engineers and Scientists II
  - Spring 2018* MATH3354-001. Differential equations I
  - Spring 2018* MATH4354-002. Differential equations II
  - Spring 2017* MATH3350-013. Higher Mathematics for Engineers and Scientists I
  - Spring 2017* MATH3351-001. Higher Mathematics for Engineers and Scientists II
  - Summer II 2016* MATH3350-202. Higher Mathematics for Engineers and Scientists I
  - Spring 2016* MATH3351-002. Higher Mathematics for Engineers and Scientists II
  - Spring 2016* MATH5332-001. Partial Differential Equations I
  - Fall 2015* MATH3351-004. Higher Mathematics for Engineers and Scientists II
  - Fall 2015* MATH3350-016. Higher Mathematics for Engineers and Scientists I
  - Spring 2015* MATH5332-001. Partial Differential Equations I
  - Spring 2015* MATH4351-001. Advanced Calculus II
  - Fall 2014* MATH4350-002. Advanced Calculus I
  - Fall 2014* MATH1320-030. College Algebra
  - Spring 2014* MATH3310-002. Introduction to Mathematical Reasoning and Proof
  - Spring 2014* MATH2360-008. Linear Algebra
  - Fall 2013* MATH2360-001. Linear Algebra
  - Fall 2013* MATH1451-H01. Calculus I With Applications-Honors
  - Spring 2013* MATH 5099-011. Partial Differential Equations III
  - Spring 2013* MATH4354. Differential Equations II
  - Fall 2012* MATH5333. Partial Differential Equations II
  - Fall 2012* MATH2450. Calculus III with Applications
  - Spring 2012* MATH5332. Partial Differential Equations I
  - Spring 2012* MATH3351. Higher Mathematics for Engineers and Scientists II
  - Fall 2011* MATH3350-010. Higher Mathematics for Engineers and Scientists I
  - Fall 2011* MATH3350-012. Higher Mathematics for Engineers and Scientists I
  - Spring 2011* MATH5341. Functional Analysis II. Section 001
  - Spring 2011* MATH5332. Partial Differential Equations
  - Fall 2010* MATH5340. Functional Analysis I
  - Fall 2010* MATH2360. Linear Algebra
  - Spring 2010* MATH4354. Differential Equations II
  - Spring 2010* MATH1352. Calculus II
  - Fall 2009* MATH3354. Differential Equations I

*Fall 2009*            MATH1351. Calculus I  
*Spring 2009*        MATH3350. Higher Mathematics for Engineers and Scientists I  
*Fall 2008*            MATH3350. Higher Mathematics for Engineers and Scientists I

- University of Minnesota, Minneapolis, Minnesota
  - Spring 2008*        MATH 1142 Short Calculus
  - Spring 2008*        MATH 1155 Intensive PreCalculus
  - Fall 2007*            MATH 5535 Dynamical Systems and Chaos
  - Spring 2007*        MATH 1031 College Algebra and Probability
  - Fall 2006*            MATH 4606 Advanced Calculus
  - Spring 2006*        MATH 1151 Pre-Calculus II
  - Fall 2005*            MATH 2263 Multivariable Calculus

### Students Advised

- 8.2023                Rahnuma Islam, Ph.D. (co-chair of Ph.D. Dissertation Committee)
- 8.2021                Isankaupul Garli Hevage, Ph.D.. (co-chair of Ph.D. Dissertation Committee)
- 8.2016                Emine Celik, Ph.D.
- 8.2014                Thinh Kieu, Ph.D. (co-advisor)

### Postdoctorates hosted

- 1.2019 – 8.2019    Dr. Phuong Nguyen
- 8.2016 – 8.2019    Dr. Dat Cao

### Defense Committee Member

- 6.2023                Mohammad Mahabubur Rahman, Ph.D. Dissertation Committee Member
- 11.2022                Pham Minh Huy Huynh, Ph. D. Defense Committee Member, Universität Klagenfurt, Austria
- 2020                    Rahnuma Islam, Master's Thesis Committee Member
- 2019                    Thakshila Gunasingha, Master's Thesis Committee Member
- 2014                    Anna Krylova, Master's Thesis Committee Member
- 2010 – 2013            Lidia Bloshanskaya, Ph.D. Dissertation Committee Member
- 2012                    Pooya Aavani, Master's Thesis Committee Member
- 5.2011                Jedidiah Gohlke, Master's Thesis Committee Member
- 11.2010                Lidia Bloshanskaya, Master's Thesis Committee Member

### Service



- University
  - 2010 – present Member of Graduate Faculty, Graduate School
  - Fall 2013, 2018, Faculty representative at the Graduation Commencement  
Aug. 2023
  - 6.14.2013 Dean's representative, Ph.D.'s defense, David Kimberly, Environmental Toxicology
  - 3.25.2013 Dean's representative, Ph.D.'s defense, Taskin Karim, Chemical Engineering
  - 3.22.2013 Dean's representative, Ph.D.'s defense, Vance Ginn, Economics
  - 6.24.2011 Dean's representative, Ph.D.'s defense, Guangqiu Qin, Environmental Toxicology
  - 6.1.2011 Dean's representative, Ph.D.'s defense, Patrick Mclaurin, Chemistry
- Department
  - 9.2023 – 11.2023 Department's SECC coordinator
  - 1.2017 – 5.2021, Co-organizer of Analysis Seminars (except on-leave Fall 2017)  
9.2023 – present
  - 4.2015 – present Peer teaching evaluations for fellow faculty
  - 2011 – present Member of Examination Committee for Preliminary Examination in PDEs
  - 2009 – present Teaching evaluations for (graduate) teaching assistants
  - 9.2020 – 5.2021 Co-organizer of Pure Mathematics Colloquium: Current Advances in Mathematics
  - 10.2019 – 5.2022 Co-advisor of students' Actuarial Science Group
  - 9.2018 – 12.2020 State Employee Charitable Campaign (SECC) coordinator for Department of Mathematics and Statistics
  - Fall 2014-Spring 2015 Member of Hiring Subcommittee: Complex Analysis
  - Spring 2013 Member of Travel Policy Committee
  - 9.2012 – 9.2013 Member of Graduate Committee
  - 12.2009 Substituting member in the Committee, Master's thesis defense, James Woodley, Mathematics
  - 8.2008 – 5.2016 Co-organizer of Applied Mathematics Seminars
- Professional
  - Expert Reviewer Ph.D. Dissertation Reviewer for Pham Minh Huy Huynh, Universität Klagenfurt, Austria, 2022

Referee           Acta Applicandae Mathematicae  
Asymptotic Analysis  
Bulletin des sciences mathématique  
Canadian Journal of Mathematics  
Communications on Pure and Applied Analysis  
Discrete and Continuous Dynamical Systems  
Electronic Journal of Differential Equations  
Hacetatepe Journal of Mathematics and Statistics  
Indiana University Mathematics Journal  
Journal of Applied Analysis and Computation  
Journal of Differential Equations  
Journal of Dynamics and Differential Equations  
Journal of Mathematical Analysis and Applications  
Journal of Mathematical Fluid Mechanics  
Journal of Mathematical Physics  
Multiscale Modeling and Simulation (SIAM Interdisciplinary Journal)  
Nonlinearity  
Nonlinear Analysis Series A: Theory, Methods and Applications  
Numerical Methods for Partial Differential Equations  
Qualitative Theory of Dynamical Systems  
Studies in Applied Mathematics

### Awards

- 2005           *L. F. Guseman Award*, Texas A&M University
- 2002 – 2005    *Departmental Graduate Fellowship*, Texas A&M University
- 2002           *AUF Fellowship*, Texas A&M University
- 2001           *James P. Williams Memorial Award*, Indiana University
- 2001           *Eberhard E. Hopf Fellowship*, Indiana University
- 1997           *Outstanding Student Award*, National University, Hochiminh City

### Other information

- Citizenship     U. S. A.
- Languages      English, Vietnamese

### References

1. **Animikh Biswas**  
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2. **Zoran Grujic**  
*Professor*  
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Birmingham AL 35294-1241  
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Webpage: <https://dornsife.usc.edu/igor-kukavica/>
  
5. **Brock Williams (teaching reference)**  
*Professor and Associate Chair*  
Department of Mathematics and Statistics, Texas Tech University  
1108 Memorial Circle, Lubbock, TX 79409-1042, USA  
Phone: (806) 834-1591  
Email address: *brock.williams@ttu.edu*  
Webpage: <https://www.math.ttu.edu/~williams/>