Tong Wu

Curriculum Vitae

Associate Professor of Practice
University of Texas at San Antonio
Department of Mathematics
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Educational Background

2011–2016 **Ph.D. Mathematics**, *Tulane University*
Advisor: Alexander Kurganov

2007–2011 **B.S. Mathematics and Applied Mathematics**, *Xi'an Jiaotong University*

Professional Employment History

2026–present **Associate Professor of Practice**, *Department of Mathematics, University of Texas at San Antonio.*

2020–2026 **Assistant Professor of Practice**, *Department of Mathematics, University of Texas at San Antonio.*

2018–2020 **Postdoctoral Fellow**, *Department of Mathematics, Tulane University*
Mentor: James M. Hyman

2018–2019 (summer) **Visiting Scholar**, *Los Alamos National Laboratory*
Applied Mathematics and Plasma Physics Group (T5)
Host: Vitaliy Gyrya, Humberto Godinez

2016–2018 **Postdoctoral researcher**, *North Carolina State University*
Mentor: Alina Chertock, Zhilin Li

2017 summer **Visiting Scholar**, *Los Alamos National Laboratory*
Applied Mathematics and Plasma Physics Group (T5)
Host: Konstantin Lipnikov

2015–2016 **Graduate Research Assistant**, *Tulane University*
Advisor: Alexander Kurganov

2015 summer **Visiting Fellow**, *Institute of Mathematics in Bordeaux and Inria*
Host: Mario Ricchiuto

2012–2013 (summer) **Visiting Fellow**, *Shanghai Jiaotong University*
Institute of Natural Sciences

Awards and Honors

2024–2025 National Impact Travel Award, UTSA (14th AIMS Conference, Abu Dhabi)

2023–2024 National Impact Travel Award, UTSA (Joint Mathematics Meetings)

2019 Postdoctoral Fellow Travel Fund, Tulane University

2015 Aug SIAM Travel Awards for ICIAM 2015

2013-2015 Summer Research Awards, Tulane University

Teaching and Mentoring Experience

Instructor (UTSA)
- 2026 Summer: Calculus II
- 2026 Spring: Applied Linear Algebra, Numerical Analysis
- 2025 Fall: Applied Linear Algebra
- 2025 Spring: Diff. Equation I
- 2024 Fall: Calculus III
- 2024 Spring: Calculus II
- 2023 Fall: Diff. Equation I, Calculus II
- 2023 Summer: Calculus II
- 2023 Spring: Linear Algebra, Calculus II
- 2022 Fall: Linear Algebra, Calculus II
- 2022 Spring: Calculus II
- 2021 Fall: Calculus III
- 2021 Spring: Calculus II
- 2020 Fall: Calculus I

(Tulane)
- 2020 Spring: Scientific Computing I
- 2019 Spring: Scientific Computing I
- 2014 Spring: Calculus III
- 2013 Fall: Statistics for Business

(NCSU)
- 2018 Spring: Calculus III
- 2017 Fall: Calculus I
- 2017 Spring: Calculus III
- 2016 Fall: Calculus II

Mentor
- Assisted in mentoring master thesis project (Elliot D Hill), optimization algorithms and visualization (Tulane, 2019-2020)
- Assisted in mentoring doctoral dissertation (Andrew Bernstein), Mathematics student, on numerical techniques for hydrodynamic and morphodynamic modeling (NCSU, 2017-2018)

Instructional Materials Developed

2026 *Calculus II — Geometry and Applications* (`mat1223-geo-app.netlify.app`). Interactive 3D visualizations of volumes of revolution and volumes by cross-sections; used in class.

2026 *The Calculus Atlas* (`calc-atlas.netlify.app`). Concept maps covering 131 ideas across Calculus I–III, for prerequisite review and preview.

2026 *CalcMatch* (`calcmatch.netlify.app`). Timed practice for derivative and antiderivative fluency at three difficulty levels.

Instructional Development Activities

Professional Development Courses

- 2026: ELEVATE Workshop in ALICE, UTSA (5 weeks, 16 contact hours)
- 2025: Promoting Active Learning, ACUE Program (6–8 weeks)
- 2022: Python for Financial Analysis, UTSA/ELVTR (6 weeks)
- 2022: Deep Learning Specialization, Coursera (12 weeks)

Workshops and Webinars

- 2026: ADA Title II for Math Faculty, UTSA
- 2026: Interdisciplinary Awareness, UT System Webinar Series
- 2026: How to Start the Semester, College of Science
- 2025–2026: Teaching and Learning with Generative Artificial Intelligence Informative Sessions, UTSA (three sessions)
- 2025: Creating Global Citizens: International Education, UT System Webinar Series
- 2025: PDF Training: Using Tools to Check and Remediate PDFs, UTSA
- 2025: Beyond the Classroom: Designing Powerful Experiential Learning, UTSA
- 2025: Analytical Thinking and Problem Solving, UT System Webinar Series
- 2025: Elevate Teaching & Learning with Apple, UTSA
- 2025: Sticky Learning: Strategies That Make Knowledge Last, UTSA
- 2025: Cultural and Social Capital, UT System Webinar Series
- 2025: Tech It Up a Notch: Digital Tools to Power Up Your Teaching, UTSA
- 2025: PowerPoint Accessibility: The Basics of Creating Accessible PowerPoint Presentations, UTSA
- 2025: Getting Started with Gradescope Bubble Sheets, UTSA
- 2025: Mentoring Strategies for Lower Division Courses and for our Non-Math Majors, UTSA Math Dept.
- 2024: OpenAI GPTs: Creating Custom AI Assistants, Coursera
- 2024: Joint Mathematics Meetings (conference attendance), MAA / AMS
- 2023: Canvas+ New Course Experience, UTSA Academic Innovation
- 2021: Innovation Academy: Course Design & Teaching Modalities, UTSA

Publications (* denotes authors in alphabetical order; IF=Impact factor)

Published [1] Zhuolin Qu and **Tong Wu**, *Multistage Spatial Model for Informing Release of Wolbachia-Infected Mosquitoes as Disease Control*, Royal Society Open Science,

13 (2026), no. 6, 251724. [Open access]

[2] Alina Chertock, Alexander Kurganov, **Tong Wu***, and Jun Yan, *Well-balanced numerical method for atmospheric flow equations with gravity*, Applied Mathematics and Computation 439 (2023), 127587. [IF: 4.01; Citation: 4]

[3] Zhuolin Qu, **Tong Wu**, and James M. Hyman, *Modeling spatial waves of Wolbachia invasion for controlling mosquito-borne diseases*, SIAM Journal on Applied Mathematics, 82 (2022), 1903-1929. [IF: 2.02; Citation: 4]

[4] Alexander Kurganov, Zhuolin Qu, and **Tong Wu***, *Well-Balanced Positivity Preserving Adaptive Moving Mesh Central-Upwind Schemes for the Saint-Venant System*, ESAIM: Mathematical Modelling and Numerical Analysis, 56, (2022), 1327-1360. [IF: 1.86; Citation: 4]

[5] Alina Chertock, A. Kurganov, Xin Liu, Yongle Liu and **Tong Wu***, *Well-Balancing Via Flux Globalization: Applications to Shallow Water Equations with Wet/Dry Fronts*, Journal of Scientific Computing, 90, Article number: 9 (2022). [IF: 2.77; Citation: 23]

[6] Alexander Kurganov, Zhuolin Qu, Olga S. Rozanova, and **Tong Wu***, *Adaptive Moving Mesh Central-Upwind Schemes for Hyperbolic System of PDEs. Applications to Compressible Euler Equations and Granular Hydrodynamics*, Communications on Applied Mathematics and Computation (2021): 1-35. [IF: 1.58; Citation: 19]

[7] Xin Liu, Xi Chen, Shi Jin, Alexander Kurganov, **Tong Wu** and Hui Yu, *Moving–Water Equilibria Preserving Partial Relaxation Scheme for the Saint-Venant System*, SIAM Journal on Scientific Computing 42.4 (2020): A2206-A2229. [IF: 3.14; Citation: 14]

[8] Alina Chertock, Alexander Kurganov,and **Tong Wu***, *Operator Splitting Based Central-Upwind Schemes for Shallow Water Equations with Moving Bottom Topography*, Communications in Mathematical Sciences 18.8 (2020): 2149-2168. [IF: 1.15; Citation: 10]

[9] **Tong Wu**, Mikhail J. Shashkov, Nathaniel Morgan, Hong Luo and Dmitri Kuzmin, *An updated Lagrangian discontinuous Galerkin hydrodynamic method for gas dynamics*, Computers & Mathematics with Applications 78.2 (2019): 258-273. [IF: 3.08; Citation: 20]

[10] Yuanzhen Cheng, Alina Chertock, Michael Herty, Alexander Kurganov, and **Tong Wu***, *A New Approach for Designing Moving-Water Equilibria Preserving Schemes for the Shallow Water Equations*, Journal of Scientific Computing 80.1 (2019): 538-554. [IF: 2.77; Citation: 61]

[11] Alina Chertock, Alexander Kurganov, Mario Ricchiuto, and **Tong Wu***, *Adaptive Moving Mesh Upwind Scheme for the Two-Species Chemotaxis Model*, Computers & Mathematics with Applications 77.12 (2019): 3172-3185. [IF: 3.08; Citation: 11]

[12] Asma Azizi, Jeremy Dewar, **Tong Wu**, and James M. Hyman, *Generating Bipartite Networks with a Prescribed Joint Degree Distribution*, Journal of complex networks 5.6 (2017): 839-857. [IF: 2.25; Citation: 15]

[13] Alexander Kurganov, Martina Prugger, and **Tong Wu***, *Second-Order Fully*

Discrete Central-Upwind Scheme for Two-Dimensional Hyperbolic Systems of Conservation Laws, Siam Journal on Scientific Computing 39.3 (2017): A947-A965. [IF: 3.14; Citation: 38]

[14] Alina Chertock, Shumo Cui, Alexander Kurganov, and **Tong Wu***, *Well-Balanced Positivity Preserving Central-Upwind Scheme for the Shallow Water System with Friction Terms*, International Journal for Numerical Methods in Fluids, 78 (2015), 355-383. [IF: 1.85; Citation: 126]

[15] Alina Chertock, Shumo Cui, and Alexander Kurganov, and **Tong Wu***, *Steady State and Sign Preserving Semi-Implicit Runge-Kutta Methods for ODEs with Stiff Damping Term*, SIAM Journal on Numerical Analysis, 53 (2015), 2008-2029. [IF: 2.65; Citation: 52]

[16] Alina Chertock, Alexander Kurganov, Zhuolin Qu, and **Tong Wu***, *On a Three-Layer Approximation of Two-Layer Shallow Water Equations*, Mathematical Modelling and Analysis, 18 (2013), 675-693. [IF: 1.74; Citation: 25]

Submitted [1] **Tong Wu**, Humberto Godinez, Vitaliy Gyrya, James M. Hyman, *Interpolated Discrepancy Data Assimilation for PDEs with Sparse Observations*, Submitted to SIAM Journal on Scientific Computing, 2025.

[2] Zhuolin Qu, **Tong Wu**, Eddy Kwessi. *Travelling Waves in Wolbachia Spread Dynamics*. Submitted to Journal of Biological Dynamics, 2025.

In Preparation [1] *Rolling Wave Capturing Scheme for Shallow Water Equations*, with Shumo Cui, in preparation.

[2] *Data Assimilation for recovering bottom topography from shallow water models*, in preparation.

[3] *Modeling Shallow Water Flows through Solid Obstacles with Windows*, with Suncica Canic, Alina Chertock, Shumo Cui, Alexander Kurganov, Abdolmajid Mohammadian and Xin Liu, in preparation.

[4] *Develop multilayer shallow water models describing flows over bottom topography with singularities*, with Alina Chertock, and Alexander Kurganov, in preparation.

Conferences and Presentations

Talks

- **The 9th Coastal Bend Mathematics and Statistics Conference**, Texas A&M International University, Laredo, TX (April 2025)
- **14th AIMS Conference 2024**, Abu Dhabi, United Arab Emirates (Dec 2024)
- **AMS 2024 Fall Central Sectional Meeting**, University of Texas at San Antonio (Sept 2024)
- **SIAM Texas-Louisiana Section**, University of Houston (Nov 2022)
- **Joint Mathematics Meetings 2022**, virtual conference (April 2022)
- **SIAM Texas-Louisiana Section**, virtual conference, Texas A&M University (Oct 2020)
- **SIAM Texas-Louisiana Section**, Southern Methodist University (Nov 2019)
- **SIAM Southeastern Atlantic Section**, University of Tennessee–Knoxville (Sept 2019)

- **Scientific Computing Around Louisiana**, Tulane University (Feb 2019)
- **SIAM Conference on Computational Science and Engineering**, Spokane, WA (Feb 2019)
- **Applied Mathematics Seminar**, University of Louisiana at Lafayette (Oct 2018)
- **SIAM Texas-Louisiana Section**, Louisiana State University (Oct 2018)
- **SIAM Annual Meeting 2018**, Portland, OR (July 2018)
- **42nd SIAM Southeastern Atlantic Sectional Conference**, University of North Carolina at Chapel Hill (March 2018)
- **SIAM Central States Section**, Colorado State University (Sept 2017)
- **Los Alamos National Laboratory**, Applied Mathematics and Plasma Physics Seminar, Center for Nonlinear Studies (July 2017)
- **SIAM Conference on Analysis of PDEs**, Scottsdale, AZ (Dec 2015)
- **The International Congress on Industrial and Applied Mathematics**, Beijing, China. (August 2015)
- **The 9th International Conference on Nonlinear Evolution Equations and Wave Phenomena**, University of Georgia (April 2015)
- **Scientific Computing Around Louisiana**, Tulane University (March 2015)

Posters

- **SIAM Texas-Louisiana Section**, UTRGV, South Padre Island, Texas, (Nov 2021)
- **Model Uncertainty: Mathematical and Statistical**, SAMSI workshop, Duke University (August 2018)
- **Scientific Computing Around Louisiana**, Tulane University (Jan 2018)
- **International Conference on Current Trends and Challenges in Numerical Solution of Partial Differential Equations**, Purdue University (July 2017)
- **Collective Dynamics in Biological and Social Systems**, Duke University (Nov 2015)

Workshop /Conferences Participation

- **2026 Texas Differential Equations Conference**, University of Texas at San Antonio (March 2026) — Session Chair
- **Joint Mathematics Meetings 2024**, San Francisco, CA (Jan 2024)
- **Numerical Methods for Shallow Water Equations and Related Models**, Southern University of Science and Technology, China (Dec 2017)
- **The 9th International Conference on Numerical Methods for Multi-Material Fluid Flow**, Santa Fe, NM (Sept 2017)
- **Uncertainty Quantification for Biological Models**, University of Tennessee (June 2017)
- **Clifford Lecture**, Tulane University (April 2017, Nov 2013)

- **Young Researchers Workshop: Stochastic and Deterministic Methods in Kinetic Theory**, Duke University (Nov 2016)
- **KI-Net Conference** on Modern Perspectives in Applied Mathematics: Theory and Numerics of PDEs, Bethesda, MD (April 2014)

Grant Activities

Unfunded Proposals

2025 NSF "Collaborative Research: IHBEM: Modeling the Interplay of Human Behaviors and Epidemiological Mechanisms" (Co-PI), $374,612. Submitted July 2025; declined February 2026. Resubmission of the 2024 proposal below. [NSF 2538899]

2024 NSF "Collaborative Research: IHBEM: Modeling the Interplay of Human Behaviors and Epidemiological Mechanisms" (Co-PI), $408,545. Submitted February 2024; declined June 2024. [NSF 2421347]

2022 UTSA GREAT Program, "Network Modeling for Controlling Sexually Transmitted Diseases" (Co-PI), not funded.

2021 NSF Mathematical Biology, "Spatial models for enhancing the effectiveness of Wolbachia to control the spread of mosquito-borne diseases" (Co-PI), not funded.

2019 Department of Energy (Advanced Scientific Computing Research), "Machine Learning Data Assimilation Algorithms for Identifying the Initial Conditions and Unknown Terms in Partial Differential Equations" (PI), not funded.

Service

Committees

- 2026: Committee Member, College Scholarship Review Committee, College of Sciences (ad hoc)
- 2023–Present: Committee Member, Curriculum Committee
- 2023–2025: Committee Member, Workload Guidelines Committee
- 2022–2023: Committee Member, Mathematics–Economics Committee
- 2020–2023: Committee Member, Website Committee
- 2021: Committee Member, FTT Promotion Committee

Course Coordination and Vertical Alignment Activities

- 2026–Present: Coordinator, MAT 2253 Course Coordination Team
- 2026–Present: Team Member, MAT 1224 Course Coordination Team
- 2025–2026: Team Member, MAT 2253 Course Coordination Team
- Summer 2024: ALICE Vertical Alignment Workgroup
- 2023, 2025: Team Member, MAT 3613 Course Coordination Team
- 2023–2024: Team Member, MAT 1223 Course Coordination Team
- 2022–2023: Team Member, MAT 2233 Course Coordination Team
- 2021–2023: Team Member, MAT 1224 Course Coordination Team
- 2020: Team Member, MAT 1214 Course Coordination Team

Student Support and Outreach

- Writing recommendation letters for undergraduate students (Archer Fellowship Program, college and departmental scholarships, McNair Scholars Program)
- Participation in UTSA Days for student outreach and recruitment
- Graduate School Fair, 20th Annual Texas Undergraduate Mathematics Conference (TUMC), St. Mary's University (Oct 2025), to promote the master's program

Professional Service

- Journal referee for SIAM Journal on Applied Mathematics, Journal of Computational Physics, Mathematics and Computers in Simulation, Applied Numerical Mathematics, Infectious Disease Modelling, and AMS Review
- Session Chair, 2026 Texas Differential Equations Conference, UTSA (March 2026)
- Poster Judge, SIAM Texas–Louisiana Section (2019)