

# Zhuolin Qu

## Curriculum Vitae

University of Texas at San Antonio  
Department of Mathematics  
✉ [zhuolin.qu@utsa.edu](mailto:zhuolin.qu@utsa.edu)  
📄 <https://zhuolinqu.github.io>

### Research Interests

Mathematical and Computational Biology, Infectious Diseases Modeling, Population Dynamics, Numerical Methods for Nonlinear PDEs, Scientific Computing, Uncertainty Quantification

### Education

- 2011–2016 **Doctor of Philosophy, Applied Mathematics, Tulane University.**  
Advisor: Alexander Kurganov  
Thesis: Fast Operator Splitting Methods for Nonlinear PDEs
- 2012–2016 **Master of Science, Statistics, Tulane University.**  
Advisor: Michelle Lacey
- 2007–2011 **Bachelor of Science, Mathematics and Computational Science, University of Science and Technology of China.**  
Advisor: Mengping Zhang

### Academic Experience

- 2020–present **Assistant Professor, Department of Mathematics, University of Texas at San Antonio.**
- 2016–2020 **Postdoctoral Fellow, Department of Mathematics, Tulane University.**  
Mentor: James (Mac) Hyman
- 2017–2019 **Visiting Scholar, Los Alamos National Laboratory.**  
(Summer) Theoretical Biology and Biophysics (T-6), Host: Benjamin McMahon
- 2015 **Summer Intern, Los Alamos National Laboratory.**  
Computational Earth Science (EES-16), Mentor: Carl Gable, Nataliia Makedonska
- 2012, 2013 **Visiting Fellow, Shanghai Jiao Tong University, China.**  
(Summer) Institute of Natural Sciences
- 2010 **Summer Intern, Pohang University of Science and Technology, Korea.**  
Combinatorial and Computational Mathematics Centre, Mentor: Kwang Ik Kim.

### Publications and Preprints (\*authors in alphabetical order)

- Published
- **Qu, Zhuolin**, Azizi, A., Schmidt, N., Craig-Kuh, M. C., Stoecker, C., Hyman, J. M., and Kissinger, P. Effect of Screening Young Men for Chlamydia Trachomatis on the Rates among Women: A Network Modelling Study for High-prevalence Communities. *BMJ Open*, 2021, 11, e040789
  - **Qu, Zhuolin**, McMahon, B. H., Perkins, D. J., and Hyman, J. M. Staged progression epidemic models for the transmission of invasive nontyphoidal Salmonella (iNTS) with treatment. *To appear in Mathematical Biosciences and Engineering, special issue*

- Azizi, A., **Qu, Zhuolin**, Lewis, B., and Hyman, J. M. Generating a Heterosexual Bipartite Network Embedded in Social Network. *To appear in Applied Network Science*
  - Thongsripong, P., **Qu, Zhuolin**, Yukich, J., Hyman J. M., and Wesson, D. An Investigation of Human-Mosquito Contact Using Surveys and its Application in Assessing Dengue Viral Transmission Risk. *Journal of Medical Entomology*, 2020, tjaal34
  - Kurganov, A., **Qu, Zhuolin\***, Rozanova, O. S., and Wu, T. 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*, 2020
  - **Qu, Zhuolin** and Hyman, J. M. Generating a Hierarchy of Reduced Models for a System of Differential Equations Modeling the Spread of *Wolbachia* in Mosquitoes. *SIAM Journal on Applied Mathematics*, 2019, 79(5):1675-1699.
  - **Qu, Zhuolin**, Xue, L., and Hyman, J. M. Modeling the Transmission of *Wolbachia* in Mosquitoes for Controlling Mosquito-Borne Diseases. *SIAM Journal on Applied Mathematics*, 2018, 78(2):826–852.
  - Thongsripong, P., **Qu, Zhuolin**, Hyman, J. M., and Wesson, D. Quantification of Mosquito Biting Rates Using Surveys and their Implication in Determining Dengue Viral Transmission Risk in the Greater New Orleans Region. In *The American Journal of Tropical Medicine and Hygiene*, 2018, 99(4)
  - Cheng, Y. Z., Kurganov, A., **Qu, Zhuolin\***, and Tang, T. Fast and Stable Explicit Operator Splitting Methods for Phase-field Models. *Journal of Computational Physics*, 2015, 303:45-65.
  - Kao, C. Y., Kurganov, A., **Qu, Zhuolin\***, and Wang, Y. A Fast Explicit Operator Splitting Method for Modified Buckley-Leverett Equations. *Journal of Scientific Computing*, 2015, 64(3):837-857.
  - Chertock, A., Kurganov, A., **Qu, Zhuolin\***, and Wu, T. Three-Layer Approximation of Two-Layer Shallow Water Equations. *Mathematical Modelling and Analysis*, 2013, 18(5):675-693.
- Under Review ◦ Azizi, A., Dewar, J., **Qu, Zhuolin**, and Hyman, J. M. Using an Agent-based Sexual-network Model to Guide Mitigation Efforts for Controlling Chlamydia.
- Stoecker, C., Monette, A., **Qu, Zhuolin**, Schmidt, N., Craig-Kuh, M. C., and Kissinger, P. Cost Effectiveness of Check It: A Novel Community-based Chlamydia Screening and Expedited Treatment Program for Young Black Men.
- Gulbudak, H., **Qu, Zhuolin**, Milner, F., and Tuncer, N., Sensitivity Analysis in an Immuno-Epidemiological Vector-Host Model.

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## Papers in Preparation (drafts available on request)

- Kurganov, A., **Qu, Zhuolin\***, and Wu, T. Well-Balanced Adaptive Moving Mesh Central-Upwind Schemes for the Saint-Venant Systems of Shallow Water Equations

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## Honors and Awards

2017–2019 **Postdoctoral Fellow Travel Fund**, *Tulane University*.

- 2017 **Health Sciences Research Days Award for Excellence in Research and Presentation by a Postdoctoral Fellow**, *Tulane University*.  
 Evaluated by a panel of judges in health science among nearly 200 presentations
- 2015–2019 **Travel Awards**, *Awarded 15 competitive grants for travel to conferences and workshops.*
- 2012–2015 **Summer Research Fellowship**, *Tulane University*.

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## Conference and Talks

- Invited Talks
- **Joint Mathematics Meetings 2021**, Mini-symposium talk, virtual, 01/2021
  - **Tulane University**, Guest lecture, “Modeling the Spread of Infectious Diseases”, virtual, 10/2020
  - **SIAM Texas-Louisiana Sectional Meeting**, Mini-symposium talk, virtual, 10/2020
  - **SIAM Texas-Louisiana Sectional Meeting**, Mini-symposium talk, Southern Methodist University, 11/2019
  - **Mathematics and Statistics Colloquium**, Georgia State University, 10/2019
  - **Population Health Science Seminar**, School of Public Health, Georgia State University, 10/2019
  - **Seventh International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA VII)**, Mini-symposium talk, Arizona State University, 10/2019
  - **Biostatistics Colloquium**, Louisiana State University Health Sciences Center, New Orleans, 10/2019
  - **Epidemiology Seminar**, School of Public Health and Tropical Medicine, Tulane University, 09/2019
  - **Fifth International Conference on Computational and Mathematical Population Dynamics (CMPD5)**, Mini-symposium talk, Fort Lauderdale, 05/2019
  - **Mathematics Colloquium**, University of Louisiana at Lafayette, 10/2018
  - **Los Alamos National Laboratory**, Brown bag meeting on disease transmission modeling and surveillance, Seminar talk, 07/2018
  - **42nd SIAM SEAS Sectional Conference**, Mini-symposium talk, UNC Chapel Hill, 03/2018
  - **Mathematical Biology Center**, Guangzhou University, Seminar talk, 11/2017
  - **Mathematics and Science College**, Shanghai Normal University, Seminar talk, 11/2017
  - **Tropical Medicine Seminar**, School of Public Health and Tropical Medicine, Tulane, 09/2017
  - **Los Alamos National Laboratory**, Center for Nonlinear Studies, Seminar talk, 08/2017
  - **Georgia State University**, Guest lecture, “How Mathematical Models are helping Guide Mitigation Efforts to Control Epidemics”, 05/2017
  - **Graduate Student Colloquium**, Tulane Mathematics Department, 09/2015

- **Los Alamos National Laboratory**, SFT Brown Bag Seminar, 08/2015
- **The Ninth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena**, Mini-symposium talk, 04/2015
- **Applied Mathematics Seminar**, Tulane Mathematics Department, 04/2014
- Contributed Talks ◦ **Biomathematics and Ecology: Education and Research (BEER)**, virtual, 11/2020
- **CDC STD Conference 2020**, Atlanta, GA, virtual, 09/2020
- **Biology and Medicine through Mathematics (BAMM!)**, Virginia Commonwealth University, 05/2020 (abstract accepted, cancelled due to COVID-19)
- **Scientific Computing around Louisiana**, Tulane University, 02/2019
- **Biomathematics and Ecology: Education and Research**, Arizona State University, 10/2018
- **SIAM Annual Meeting 2018**, Portland, OR, 07/2018
- **Scientific Computing around Louisiana**, Louisiana State University, 02/2018
- **SIAM Annual Meeting 2017**, Pittsburgh, PA, 07/2017
- **Scientific Computing around Louisiana**, Tulane University, 03/2017
- Posters ◦ **SAMSI workshop on Model Uncertainty: Mathematical and Statistical**, Duke University, 08/2018
- **MBI Emphasis Workshop on Multiscale Dynamics of Infections**, Ohio State University, 04/2018
- **NIH-MIDAS Network Meeting**, 04/2018
- **29th Annual Health Sciences Research Days**, Tulane University, 02/2018
- **SMB Annual Meeting 2017**, 07/2017
- **NIH-MIDAS Network Meeting**, 05/2017
- **SIAM Conference on Computational Science and Engineering**, 03/2017
- **28th Annual Health Sciences Research Days**, Tulane University, 02/2017
- **KI-Net: Collective Dynamics in Biological and Social Systems**, 11/2015
- **Los Alamos National Laboratory**, Student Symposium: “Championing Scientific Careers”, 08/2015
- **Scientific Computing Around Louisiana**, Tulane University, 03/2015
- Workshops Conferences ◦ **Joint Mathematics Meetings 2021**, Short course on “Mathematical and Computational Methods for Complex Social Systems”, virtual, 01/2021
- **Mathematics Research Communities**, “Dynamics of Infectious Diseases: Ecological Models Across Multiple Scales”, 06 - 08/2020, virtual
- **Workshop on Modeling the Spread of Infectious Diseases**, Tulane University, 02/2019 & 02/2020
- **NIMBioS Tutorial: Network Modeling**, University of Tennessee, 02/2019
- **Joint Research Conference on Statistics in Quality, Industry, and Technology**, Santa Fe, 06/2018
- **9th Annual Summer Institute in Statistics and Modeling in Infectious Diseases**, University of Washington, 07/2017

- **NIMBioS Tutorial: Uncertainty Quantification for Biological Models**, 06/2017
- **SAMSI Summer School on Optimization**, 08/2016
- **KI-Net Conference** on Modern Perspectives in Applied Mathematics: Theory and Numerics of PDEs, 04/2014

## Service

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| Journal Referee | Journal of Biological Dynamics, PLoS ONE, Journal of Theoretical Biology, Mathematical Biosciences, Letters in Biomathematics, Journal of Biological Systems   |
| Organizer       | <ul style="list-style-type: none"> <li>◦ SIAM Texas-Louisiana Meeting, mini-symposium, “Mathematical and computational models for understanding emerging epidemics and evaluating intervention strategies”, 10/2020</li> <li>◦ New Orleans workshop on Modeling the Spread of Infectious Diseases, Tulane University, Spring 2019 &amp; Spring 2020</li> </ul>   |
| Co-organizer    | Clifford Lectures, Tulane University, 2017   |
| Committee       | <ul style="list-style-type: none"> <li>◦ Admission Committee for Applied and Industrial Math Master (AIM) Program, University of Texas at San Antonio, Fall 2020</li> <li>◦ Committee for Department Website, University of Texas at San Antonio</li> </ul>  |
| Media Coverage  | <ul style="list-style-type: none"> <li>◦ <b>Math Horizons</b>, Evelyn J. Lamb, “Fighting an Epidemic with an Epidemic”, <i>Math Horizons</i>, 2019, 26:4, 22-23, DOI: 10.1080/10724117.2019.1574148</li> <li>◦ <b>Forbes Magazine</b>, Innovation-Science, “Math-Based Mosquito Control To Prevent Human Diseases”, January 14th, 2019</li> <li>◦ <b>Los Alamos Monitor</b>, “Solving epidemics with math”, October 10th, 2018</li> <li>◦ <b>The Times-Picayune</b>, “Tulane researchers use math to contain the spread of mosquito-borne illnesses”, August 30th, 2018</li> <li>◦ <b>SIAM News</b>, Research Nugget on “Sustained bacterial outbreak in mosquitoes limits spread of life-threatening diseases”, March 20th, 2018</li> </ul> |
| Poster Judge    | <ul style="list-style-type: none"> <li>◦ School of Science and Engineering Research Day, Tulane University, 2018, 2019</li> <li>◦ SIAM Texas-Louisiana Sectional Meeting, 2019</li> </ul>  |
| Newcomb Fellow  | Newcomb College Institute, 2016–2020, voluntary association of faculty from all undergraduate colleges to support women’s leadership/gender equity and foster faculty-student interaction and research   |

## Teaching Experience

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| Instructor of Record | University of Texas at San Antonio   |
|                      | <ul style="list-style-type: none"> <li>◦ MAT 1193: Calculus for Biosciences, Fall 2020, Spring 2021, online</li> </ul>   |
|                      | Tulane University  |
|                      | <ul style="list-style-type: none"> <li>◦ MATH 758: Scientific Computation III (graduate), Spring 2018, Spring 2019</li> <li>◦ MATH 731: Applied Mathematics (graduate), Spring 2020</li> <li>◦ MATH 221: Calculus III, Fall 2016</li> <li>◦ MATH 122: Calculus II, Fall 2013</li> <li>◦ MATH 116: Long Calculus II, Spring 2014</li> </ul> |

- Teaching Assistant
  - MATH 309/609: Linear Algebra, Fall 2012, Spring 2013
  - MATH 224: Introduction to Applied Mathematics, Spring – Fall 2012, Spring 2015
  - MATH 131: Consolidated Calculus, Fall 2014
  - MATH 221: Calculus III, Spring 2012
  - MATH 122: Calculus II, Spring 2016
  - MATH 121: Calculus I, Fall 2011, Fall 2015
- Guest Teaching Lectures
  - MATH 732: Applied Mathematics II (graduate), Spring 2017
  - MATH 635: Optimization (graduate), Fall 2018
  - MATH 424/624: Ordinary Differential Equation, Fall 2016
- Workshop “Ready, Prep, Teach!”, The Center for Engaged Learning and Teaching (CELT), Tulane University, Spring 2019

## Mentoring Experience

- Doctoral Dissertation
  - Assist in mentoring doctoral dissertation, Mathematics student, on modeling epidemics with distribution parameters, committee member for Dissertation defense (Tulane, 2017-2019)
  - Assist in mentoring doctoral dissertation, Biostatistics student, on characterizing the spread of epidemics over networks (Tulane, 2018-2020)
  - Assist in mentoring doctoral dissertation, Public Health student, on quantifying human-mosquito contact rate, manuscript submitted. (Tulane, 2017-2018)
- Master Thesis
  - Assist in mentoring master thesis project, Computational Science student, on modeling chikungunya disease and quantifying model uncertainty (Tulane, 2018-2019)
  - Assist in mentoring master project, Computational Science student, on modeling the Chagas disease in the New Orleans area and estimating human risk. (Tulane, 2018-2020)
- Honor Thesis
  - Assist in mentoring undergraduate honor thesis, Neuroscience student, on modeling Tuberculosis progression with treatment, Senior Scholar Award for undergraduate (Tulane, 2018-2019)
  - Assist in mentoring undergraduate honor thesis, Mathematics student, on characterizing the stochastic spread of epidemics over networks (Tulane, 2018-2020)
- Conference Mentor at Society of Mathematical Biology annual meeting 2017 and 2020

## Computer Skills

- Script Matlab, Octave, Fortran, Mathematica, C, R, Python, Maple, MySQL, NetLogo
- Software Latex, Git, Vim, Inkscape, Gephi, ParaView, Adobe Illustrator, Origin
- Other MPI, PETSc, LaGriT, PFLOTRAN