CURRICULUM VITAE
WENBO TANG

POINT OF CONTACT

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PROFESSIONAL INTEREST

Theoretical and numerical studies of differential equations and dynamical systems relevant to mixing and transport processes in environmental & geophysical flows and their impacts.

EDUCATION

- **2005 Ph.D.** Mechanical Engineering, University of California, San Diego
- **2002 M.Sc.** Mechanical Engineering, University of California, San Diego
- **2001 B.Eng.** Engineering Mechanics, Zhejiang University

PROFESSIONAL EXPERIENCE

- **Associate Professor** Aug. 2014 — present
  Arizona State University, School of Mathematical & Statistical Sciences, Tempe, AZ
- **Assistant Professor** Aug. 2008 — July 2014
  Arizona State University, School of Mathematical & Statistical Sciences, Tempe, AZ
- **Postdoctoral Associate** Aug. 2006 — July 2008
  Massachusetts Inst. Technology, Dept. of Mechanical Engineering, Cambridge, MA
- **Postdoctoral Researcher** Oct. 2005 — Aug. 2006
  UC San Diego, Dept. of Mechanical & Aerospace Engineering, La Jolla, CA

OTHER AFFILIATIONS

- 2008-present Member, Mathematical, Computational and Modeling Sciences Center, ASU
- 2008-present Affiliated Member, Department of Mechanical & Aerospace Engineering, ASU

FELLOWSHIPS AND AWARDS

- 2012 Staff Member, 54th Geophysical Fluid Dynamics summer program, Woods Hole Oceanographic Institution

- 2009-2010 Mathematical Association of America, ProjectNExT fellow (New Experiences in Teaching)
- 2005 UC San Diego Dissertation Fellowship
- 2002 Pacific Institute of Mathematical Sciences Fluid Dynamics Summer School Fellowship
- 2001-2005 UC San Diego Graduate Student Research Fellowship

SPONSORED RESEARCH

- **Current grants**
  1. NSF, DMS-1212144, Collaborative Research: Theories and experiments on scalar mixing in chaotic flows, PI: **Tang, W.**, 100%, $184,274, 2012-2015
  2. NSF, DMS-1148771, MCTP: Mathematics Mentoring Partnership Between ASU and Maricopa County Community College District. PI: Kostelich, E., Co-PI: **Tang, W.**, 5%, $1,099,808, 2012-2017
- **Past grants**
  1. NSF, ATM-0934592: Multiscale Modeling of Urban Atmospheres in a Changing Climate, PI: Mahalov, A., Co-PI: **Tang, W.**, 19%, $774,986, 2009-2013
     - ASU CMG website: http://math.asu.edu/~cmg. Created and maintained website for NSF funded research on impacts of urban atmospheres in a changing climate.
  2. NSF, DMS-0922864: Visualization of Complex Spatio-Temporal Multiscale Fluid Dynamic Phenomena, PI: Mittleman, R., Co-PI: **Tang, W.**, 20%, $113,890, 2009-2010

PUBLICATIONS

- **Refereed journal publications (Student authors*; Corresponding authors; citation counts are based on Google Scholars)**
  1. Knutson, B.*, Tang, W. (50%), & Chan, P. W., "Lagrangian Coherent Structure Analysis of Terminal Winds: three-dimensionality, intra-model variations, and flight analyses." *Advances in Meteorology*, **2015**, (2015): 816727
  2. Hon, K. K., Chan, P. W., Chiu, Y. Y. & Tang, W. (25%), "Application of Short-range LIDAR in Early Alerting for Low level Windshear and Turbulence at the Hong Kong International Airport." *Advances in Meteorology*, **2014** (2014): 162748
  3. Tang, W. (80%), Mahalov, A., "The response of charged density due to breaking inertial gravity wave in the lower regions of ionosphere." *Phys. Plasmas*, **21** (2014):042901

     Impact factor 2.147, citation count 2.
  4. Tang, W. (80%) & Luna, C.*, "Dependence of advection-diffusion-reaction on flow coherent structures." *Phys. Fluids*, **25** (2013): 106602

5. Tang, W. (70%) & Mahalov, A., "Stochastic Lagrangian dynamics for charged flows in the E-F regions of ionosphere." *Phys. Plasmas*, **20** (2013): 032305.
   Impact factor 2.147, citation count 8.
6. Tang, W. (70%) & Walker, P.*, "Finite-time statistics of scalar diffusion in Lagrangian coherent structures." *Phys. Rev. E*, **86** (2012): 045201(R). **(Fig. 4b featured in Phys Rev E's Oct. 2012 issue of Kaleidoscope.)**
   Impact factor 2.255, citation count 2.
7. Tang, W. (50%), Knutson, B.*, Mahalov, A. & Dimitrova, R., "The geometry of inertial particle mixing in urban flows, from deterministic and random displacement models." *Phys. Fluids*, **24** (2012): 063302. **(Fig. 10 featured on the cover of June 2012 issue of Phys Fluids.)**
   Impact factor 1.722, citation count 6.
8. Tang, W. (70%), Haller, G. & Chan, P. W., "Lagrangian Characterization of Terrain Induced Turbulence Based on LIDAR Observations. Part II: Flow Characteristics and Airplane Approaches." *J. Appl. Meteor. Clim.*, **50** (2011): 2167–2183.
   Impact factor 1.918, citation count 6.
9. Tang, W. (70%), Haller, G. & Chan, P. W., "Lagrangian Characterization of Terrain Induced Turbulence Based on LIDAR Observations. Part I: Turbulence structure detection." *J. Appl. Meteor. Clim.*, **50** (2011): 325–338.
   Impact factor 1.918, citation count 23.
10. Tang, W. (60%), Taylor, J. E. & Mahalov, A., "Lagrangian Dynamics in Stochastic Inertia-Gravity Waves." *Phys. Fluids*, **22** (2010): 126601.
    Impact factor 1.722, citation count 4.
11. Tang, W. (50%), Mathur, M.*, Haller, G., Hahn, D. C. & Ruggiero, F. H., "Lagrangian Coherent Structures near a subtropical jet stream." *J. Atmos. Sci.*, **67**, 7 (2010): 2307–2319.
    Impact factor 2.600, citation count 28.
12. Tang, W. (70%) & Peacock, T., "Lagrangian Coherent Structures and internal wave attractors." *Chaos*, **20** (2010): 017508.
    Impact factor 2.081, citation count 14.
13. Tang, W. (70%), Chan, P. W. & Haller, G., "Accurate Extraction of LCS over Finite Domains, with Application to Flight Data Analysis over Hong Kong International Airport." *Chaos*, **20** (2010): 017502.
    Impact factor 2.081, citation count 34.
14. Tang, W. (50%), Caulfield, C. P. & Kerswell, R. R., "A prediction for the optimal stratification for turbulent mixing." *J. Fluid Mech.*, **634** (2009): 487–497.
    Impact factor 2.453, citation count 7.

15. Tang, W. (50%), Haller, G., Baik, J.-J. & Ryu, Y.-H., "Locating an atmospheric pollution source using slow manifolds." *Phys. Fluids*, **21** (2009): 043302.
    Impact factor 1.722, citation count 10.
16. Tang, W.* (40%), Caulfield, C. P. & Young, W. R., "Bounds on dissipation in stress-driven flow in a rotating frame." *J. Fluid Mech.*, **540** (2005): 373–391.
    Impact factor 2.453, citation count 0.
17. Tang, W.* (40%), Caulfield, C. P. & Young, W. R., "Bounds on dissipation in stress-driven flow." *J. Fluid Mech.*, **510** (2004): 333–352.
    Impact factor 2.453, citation count 7.
18. Caulfield, C. P., Tang, W.* (30%) & Plasting, S. C., "Reynolds number dependence of an upper bound for the long-time-averaged buoyancy flux in a plane stratified Couette flow." *J. Fluid Mech.*, **498** (2004): 315–332.
    Impact factor 2.453, citation count 7.

- **Under Review (Student authors*, Corresponding authors)**

1. Walker, P.*, Tang, W. (50%) & del-Castillo-Negrete, D., "Scalar residence time statistics dependent on coherent structure identifications." (*Chaos*)
2. Tang, W. (60%), Dhumuntarao, A.*, "Bistability in inhomogeneity — effects of flow coherent structures on the fate of a bistable reaction." (*Phys. Fluids*)
3. Walker, P.*, Helmstetter, A.* & Tang, W. (20%), "Randomized Singular Value Decomposition for Phase Space Partitions in Dynamical Systems." (*Physica D*)
4. Huang, K., Shen, B., Lang, X., Tang, W. (15%), Peng, Y., Ke, S., Ma, H. & Li, F., "Magnesium isotopic compositions of Mesoproterozoic dolostones: Implications for the Mg isotopic systematics of marine carbonate." (*Geochimica et Cosmochimica Acta*)

- **In Preparation**

1. Durazo. J.*, Kostelich, E., Tang, W. (20%) & Mahalov, A., "Assessing a local ensemble transform Kalman Filter: Observing system experiments with an ionospheric model." (*Conference Proceedings by the Physica Scripta*)
2. Peng, Y., Shen, B., Lang, X., Huang, K., Chen, J., Yan, Z., Tang, W. (10%) Ke, S., Ma, H. & Li, F., "Mg isotope evidence for dolomitization by contemporaneous seawater." (*Geochimica et Cosmochimica Acta*)
3. Knutson, B.*, Tang, W. (50%), & Chan, P. W., "Lidar Data Assimilation in WRF at the Hong Kong International Airport.' (*J. Appl. Meteor. Clim.*.)

- **PhD Thesis**
  - What can variational calculus tell us about ocean turbulence: rigorous bounds on mixing and dissipation in geophysical flows (2005) *PhD Thesis*, U. California, San Diego.

- **Published refereed abstracts for conference presentations**

1. Tang, W., Luna, C. & Dhumuntarao, A., "Biological reactions with coherent structures." *Mathematisches Forschungsinstitut Oberwolfach workshop on Mixing, Transport and Coherent Structures, Report No. 04/2014,* Jan. 26th – Feb. 1st, 2014, Oberwolfach, Germany.
2. Tang, W., Chan, P. W. & Haller, G., "Lagrangian Coherent Structures in Finite Domains." *16th US Congress of Theoretical and Applied Mechanics*, June 27th-July 2nd, 2010, State College, PA.
3. Tang, W., Haller, G. & Chan, P. W., "Lagrangian Coherent Structures and Turbulence Detection near the Hong Kong International Airport based on LIDAR Measurements." *American Meteorological Society 17th Conference on Atmospheric and Oceanic Fluid Dynamics*, June 8th-12th, 2009, Stowe, VT.

PRESENTATIONS

- **Invited Lectures**

1. Mar. 2014 *Biological reactions in coherent structures.* Applied Sciences Seminar, ASU Polytechnic, Mesa, AZ
2. Mar. 2014 *Simulations of bacteria foraging in turbulent water.* Ecological modeling guest lecture, ASU Polytechnic, Mesa, AZ
3. Mar. 2013 *Finite-time scalar diffusion-reaction with Lagrangian coherent structures.* Applied Math, University of Arizona, Tuscon, AZ
4. July 2012 *Eddy diffusion in Lagrangian coherent structures.* Geophysical Fluid Dynamics program, Wood Hole Oceanographic Institution, Woods Hole, MA
5. Dec. 2010 *Direct numerical simulation of micro-organism foraging with DIABLO.* School of Earth and Space Explorations, Arizona State University, Tempe, AZ
6. Nov. 2010 *Lagrangian Coherent Structures in Urban Flows.* BP Institute, Cambridge University, Cambridge, UK
7. Nov. 2010 *Lagrangian Coherent Structures in Urban Flows.* Mathematics, University of Bristol, Bristol, UK

8. Oct. 2010 *Lagrangian Coherent Structures in Urban Flows.* Applied Mathematics, University of Arizona, Tuscon, AZ
9. Aug. 2010 *Stirring, Mixing and Lagrangian Coherence – From Mathematics to Applications.* Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA
10. May 2010 *Stirring, Mixing and Lagrangian Coherence – From Mathematics to Applications.* Applied Mathematics Seminar, McGill University, Montreal, Canada
11. Mar. 2010 *Stirring, Mixing and Lagrangian Coherence – From Mathematics to Applications.* Fluid Dynamics Seminar, UC San Diego, La Jolla, CA
12. Mar. 2010 *Stirring, Mixing and Lagrangian Coherence – From Mathematics to Applications.* Ecosystems Engineering Seminar, ASU, Tempe, AZ
13. Mar. 2008 *Anatomy of chaotic mixing and locating Clear-Air-Turbulence.* Applied Mathematics, University of Waterloo, Waterloo, ON, Canada
14. Feb. 2008 *Anatomy of chaotic mixing and locating Clear-Air-Turbulence.* Mathematics, Arizona State University, Tempe, AZ
15. Nov. 2007 *Anatomy of geophysical mixing.* Mechanical Engineering Seminar Massachusetts Institute of Technology, Cambridge, MA
16. Nov. 2005 *What can variational calculus tell us about ocean turbulence.* Environmental Science & Engineering, California Institute of Technology, Pasadena, CA

- **Invited Conference Presentations**

1. Oct. 2014 *The domain dependence of reaction processes in chaotic flows.* Workshop on Turbulence, transport and mixing, IPAM, Univ. California Los Angeles, CA
2. July 2014 *Biological reactions in coherent structures.* The 10th AIMS conference on dynamical systems, differential equations and applications, Madrid, Spain
3. Jan. 2014 *Biological reactions in coherent structures.* Workshop on Mixing, Transport and Coherent Structures, Oberwolfach, Germany
4. Oct. 2012 *Advances in airflow hazard detection at the Hong Kong International Airport.* American Mathematical Society Sectional Meeting, Tuscon, AZ
5. July 2012 *Lagrangian coherent structures and eddy diffusion.* The 9th American Institute of Mathematical Sciences Conference on Dynamical Systems, Differential Equations and Applications, Orlando, FL

6. June 2012 *Lagrangian coherent structures and eddy diffusion.* Society of Industrial and Applied Mathematics Conference on Nonlinear Waves and Coherent Structures, Seattle, WA
7. May 2011 *Variability of chemotaxis with Lagrangian coherent structures.* Workshop on 'Coherent Structures in Dynamical Systems', Lorentz Center, Leiden, Netherlands
8. July 2010 *Lagrangian Coherent Structures in Finite Domains.* US National Congress on Theoretical and Applied Mechanics, State College, PA
9. Mar. 2008 *Locating Clear-Air-Turbulence from model- and sensor- data.* TCATS: Air Force Office of Scientific Research Workshop, Dayton, OH
10. May 2007 *Lagrangian Coherent Structures and Clear Air Turbulence.* Society of Industrial and Applied Mathematics Conference on Applications of Dynamical Systems, Snowbird, UT
11. Mar. 2007 *Lagrangian Coherent Structures in Clear Air Turbulence.* Society of Industrial and Applied Mathematics Conference on Mathematical & Computational Issues in the Geosciences, Santa Fe, NM
12. Dec. 2006 *Locating Lagrangian Coherent Structures in Clear Air Turbulence.* Air Force Office of Scientific Research Workshop, Challenges of Multiscale Atmospheric Turbulence: High Performance Computing, Physical Modeling and Observational Advances, Tempe, AZ

- **Contributed Lectures**

1. Oct. 2014 *The domain dependence of reaction processes in chaotic flows.* Math Biology seminar SoMSS, Arizona State University, Tempe, AZ
2. Oct. 2011 *How hard can you drive a fluid? A priori estimates on the energy budget for turbulent flows.* Nonlinear dynamics, Enviro Science, Sustainability Seminar, Tempe, AZ
3. Oct. 2009 *Lagrangian transport in Chaotic flows.* Computational Science Training for Undergraduates in the Mathematical Sciences (CSUMS) Seminar, Tempe, AZ
4. Mar. 2009 *Bacteria swam over the sea, swim bacteria swim!* ASU Applied Math Pro Seminar, Tempe, AZ
5. Oct. 2008 *Bacteria swam over the sea, swim bacteria swim!* Computational Science Training for Undergraduates in the Mathematical Sciences (CSUMS) Seminar, Tempe, AZ

6. Jun. 2006 *Internal tide generation at a 3D steep ridge.* Physical Oceanography Seminar, Scripps Institution of Oceanography, La Jolla, CA
7. Oct. 2005 *Simple Kinetic Energy Bounds in Plane Couette Flow.* Physical Oceanography Seminar, Scripps Institution of Oceanography, La Jolla, CA
8. Nov. 2003 *Optimal bounds on dissipation in stress driven flow.* Physical Oceanography Seminar, Scripps Institution of Oceanography, La Jolla, CA
9. May 2003 *Generating bounds in geophysical flows.* Physical Oceanography Seminar, Scripps Institution of Oceanography, La Jolla, CA

- **Contributed Conference Presentations**

1. Nov. 2014 *Variability of reaction in chaotic flows - an approach based on Lagrangian coherent structures,* 67th Annual Meeting of the American Physical Society Division of Fluid Dynamics, San Francisco, CA
2. May 2013 *Finite-time Scalar Reaction-diffusion with Lagrangian Coherent Structures.* Society of Industrial and Applied Mathematics Conference on Applications of Dynamical Systems, Snowbird, UT
3. Nov. 2012 *Passive scalar statistics and its dependence on Lagrangian coherent structures in stochastic flows.* 65th Annual Meeting of the American Physical Society Division of Fluid Dynamics, San Diego, CA
4. June 2010 *Stochastic Lagrangian Mixing In An Inertia-Gravity Wave.* Wave Phenomena IV, Edmonton, Canada
5. Nov. 2009 *Uncertainties in Lagrangian mixing.* 62nd Annual Meeting of the American Physical Society Division of Fluid Dynamics, Minneapolis, MN
6. June 2009 *Lagrangian Coherent Structures and Turbulence Detection near the Hong Kong International Airport based on LIDAR Measurements.* American Meteorological Society 17th Conference on Atmospheric and Oceanic Fluid Dynamics, Stowe, VT
7. Jan. 2009 *Lagrangian Coherent Structures in the Environment.* Los Alamos Days Conference, Tempe, AZ
8. Nov. 2008 *Finding Lagrangian Coherent Structures from Spatially Limited Flow Data.* 61st Annual Meeting of the American Physical Society Division of Fluid Dynamics, San Antonio, TX
9. Nov. 2007 *Extracting Lagrangian Coherent Structures and locating Clear Air Turbulence.* 60th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Salt Lake City, UT

10. Nov. 2005 *Bounds on stratified mixing with a mixing coefficient constraint.* 58th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Chicago, IL
11. Nov. 2004 *Bounds on dissipation in stress driven flow in a rotating frame.* 57th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Seattle, WA
12. Nov. 2003 *Optimal bounds on dissipation in stress driven flow.* 56th Annual Meeting of the American Physical Society Division of Fluid Dynamics, East Rutherford, NJ

- **Posters**

1. Apr. 2010 *Lagrangian dynamics in stochastic inertia-gravity waves.* Institute for Mathematics and its Applications Workshop on Transport and Mixing in Complex and Turbulent Flows, Minneapolis, MN
2. Jan. 2007 *Locating Lagrangian Coherent Structures in Clear Air Turbulence.* Dynamics Days International Conference on Chaos and Nonlinear Dynamics, Boston, MA
3. Feb. 2005 *Optimal bounds on dissipation in stress driven flow.* Jacobs School of Engineering Research Review, University of California, San Diego, La Jolla, CA
4. Feb. 2004 *Bounds on buoyancy flux in stratified plane Couette flows.* Jacobs School of Engineering Research Review, University of California, San Diego, La Jolla, CA

- **Presentations and posters delivered by coauthors and students (Students*)**

1. Mar. 2015 *Bistability in Inhomogeneity – Effects of Flow Coherent Structures on the Fate of a Bi-stable Reaction.* APS March Meeting 2015 (delievered by Dhumuntarao, A.*).
2. Jan. 2015 *Bistability in Inhomogeneity – Effects of Flow Coherent Structures on the Fate of a Bi-stable Reaction.* Joint Mathematics Meetings 2015 (delievered by Dhumuntarao, A.*).
3. Nov. 2014 *Effects on finite-time scalar statistics by partitioning metric.* 67th Annual Meeting of the American Physical Society Division of Fluid Dynamics, San Francisco, CA (delivered by Walker, P.*)
4. Jan. 2014 *Dependence of Advection-Diffusion-Reaction on Flow Coherent Structures.* KAUST Winter Enrichment Program, Saudi Arabia (poster delievered by Luna, C.*).
5. May 2013 *Direct Numerical Simulation of Phytoplankton Blooms.* AZBioExpo 2013, Tempe, AZ (poster delievered by Luna, C.*).

6. Apr. 2013 *Direct Numerical Simulation of Phytoplankton Blooms.* American Physical Society April Annual Meeting. Denver, CO (poster delievered by Luna, C.*).
7. Feb. 2013 *Direct Numerical Simulation of Phytoplankton Blooms.* American Association for the Advancement of Science Annual Meeting. Boston, MA (poster delievered by Luna, C.*). **(Best student poster in Math, Technology and Engineering.)**
8. Nov. 2012 *Finite-time statistics of scalar diffusion in Lagrangian coherent structures.* 65th Annual Meeting of the American Physical Society Division of Fluid Dynamics. San Diego, CA (delievered by Walker, P.*).
9. Oct. 2012 *Finite-time statistics of scalar diffusion in Lagrangian coherent structures.* American Mathematical Society Sectional Meeting, Tuscon, AZ (delievered by Walker, P.*).
10. Aug. 2010 *Lagrangian characterization of terrain induced turbulence based on LIDAR observations: flow characteristics and airplane approaches at Hong Kong International Airport (HKIA).* American Meteorological Society 14th Conference on Mountain Meteorology, Lake Tahoe, CA (delivered by Chan, P. W.).
11. May 2010 *Lagrangian Coherent Structure extraction in finite domains.* American Institute of Mathematical Sciences Conference on Dynamical Systems, Differential Equations and Applications, Dresden, Germany (delievered by Haller, G.).
12. Nov. 2009 *Bacteria foraging in turbulent waters.* 62nd Annual Meeting of the American Physical Society Division of Fluid Dynamics. Minneapolis, MN (delievered by Taylor, J. R.).
13. Nov. 2003 *Optimal bounds on the buoyancy flux in stably stratified Couette flow.* 56th Annual Meeting of the American Physical Society Division of Fluid Dynamics. East Rutherford, NJ (delievered by Caulfield, C. P.).

EDUCATIONAL ACTIVITIES

- **Teaching and Curriculum Development**
  - Arizona State University:
    Participation at the ProjectNEXT program helped me develop a pedagogy that focuses on concept-based learning. My educational background in engineering, armed with this approach, naturally strengthens my teaching in engineering and applied math courses. Accordingly I have revised lecture notes for all courses I have taught at ASU to emphasize practical meaning of mathematical approaches and promote a concept-based learning experience. Some hands-on exercise modules are developed for 200-300 level undergraduate courses, whereas a project-based approach has been implemented towards 400-500 level courses.

    1. Calculus for Engineers II (MAT 266), SP12, FA12, service course, large enrollments
    2. Calculus for Engineers III (MAT 267), SP09, service course, large enrollments
    3. Modern Differential Equations (MAT 275), SP11, FA11, FA14, service course, large enrollments
    4. Applied Linear Algebra (MAT 343), FA10, SP11, SP12, SP13, service course, large enrollments
    5. Intro Chaos/Nonlinear Dynamics (MAT 452), FA09
       - Directed group projects based on students' disciplines
    6. Applied Partial Differential Equations (MAT 462), FA08, FA09, SP10, FA11, FA14, servicing math majors and engineering graduate students
    7. Honors directed study, Honors Thesis (MAT492, MAT493), SP09—SP13
       - Directed 2-3 research projects every year
       - Several of these research projects resulted in honors theses
    8. Applied Dynamical Systems Methods (MAT 560/APM 560), SP09, FA10 (shared teaching)
       - Renovated course content to include recent advances on mixing and transport
       - Directed individualized projects to promote course-relevant research in students' respective disciplines
    9. Seminar: Nonlinear Dynamics, Environmental Sciences & Sustainability (APM 591), FA11 (shared teaching)
       - Newly developed graduate seminar course
  - Massachusetts Institute of Technology: Nonlinear Dynamics I: Chaos (2.050J, Teaching Assistant), FA07: enrollment 40

  - UC San Diego: Computational Methods in Engineering (MAE 107, Teaching Assistant), SP04: enrollment 120

- **Graduate Students Supervised (As committee chair, at ASU)**
  - PhD Students
    - Phillip Walker, Applied Mathematics, current
    - Brent Knutson, Applied Mathematics, expected SP14
  - Master Graduate Students
    - Phillip Walker, Mechanical Engineering, 2010

- **Graduate Student Committees (As committee member, at ASU)**
  - PhD Students
    - Kai Zhou, Mechanical Engineering, current
    - Juan Durazo **(Hispanic)**, Applied Mathematics, current
    - Angela Peace, Applied Mathematics, 2014
    - Yuqin Zhao, Applied Mathematics, 2014
    - Jeremiah Jones, Applied Mathematics, 2013 (substitute member for oral defense)
    - Sina Ghods, Mechanical Engineering, 2013
    - Stephen Shaffer, Mechanical Engineering, expected in 2013 (substitute member for oral defense)
    - Antonio Rubio **(Hispanic)**, Mathematics, 2009 (substitute member for oral defense)

- **Undergraduate Student Committees**
  - As research advisor and committee chair

    Christopher Luna (**Hispanic**, undergraduate research 12'-15'), James Upton (honors thesis 13'), Angelica Diebel (**female**, honors thesis 13') , Tim Lai (honors thesis 12'), Christian Wake (honors thesis 12')
  - Directed research and as reader

    Jordan Martel (honors thesis 11'), Ryan Haines (honors thesis 10'), Dustin Franklin (honors thesis 10'), Lee Denison (honors thesis 09')

- **Undergraduate Students Advised**
  - Undergraduate research projects directed

    Aditya Dhumuntarao (MCTP 14′), Craig Gassaway (MCTP 13′), Eric Van Buren (CSUMS 12′), Scott Van Buren (CSUMS 12′), Hershey Kelly (**Phillipino female**, CSUMS 11′), Peter Bradshaw (CSUMS 11′), Zachary Harrison (CSUMS 11′), Sadia Afroz (**female**, undergraduate research 10′), Juan Durazo (**Hispanic**, CSUMS 10′), Maria Monks (**female**, UROP, MIT, 07′)
  - Honors projects advised

    Joshua Feinglass (MAT343 13′), Wesley Fullmer (MAT343 13′), Brandon Kral (MAT343 13′), Drake Silbernagel (MAT343 13′), Sumbhav Sethia (MAT343 13′), Michael Storto (MAT343 13′), Tyler Somers (MAT343 13′), Myrtle Lin (**female**, MAT343 13′), Emily Berk (**female**, MAT343 13′), Stefano Boccieri (MAT266 12′), Melissa Dunn (**female**, MAT266 12′), Ellen Snow (**female**, MAT266 12′), Taylor Deegan (**female**, MAT266 12′), Andrew Hickey (MAT266 12′), David Tze (MAT266 12′), Alexandra Nazareno (**female**, MAT266 12′), Aidan Coyle (MAT343 12′), Sean Hanson (MAT343 12′), Mark Karlsrud (MAT343 12′), Matthew Kotin (MAT343 12′), Eric Morgan (MAT343 12′), Kyrra Richard (**female**, MAT343 12′), Jacob Sciacca (MAT343 12′), Aman Sharma (MAT343 12′), Kevin Thomas (MAT343 12′), Joe Carpenter (MAT275 11′), Christopher Luna (**Hispanic**, MAT275 11′), Ethan Ward (MAT275 11′), Beejal Shah (**female**, MAT343 10′), Pankti Shah (**female**, MAT343 10′), Jay Ryan (MAT343 10′)

PROFESSIONAL SERVICE

- **National & International Level**
  - Conference Organization

    • Co-organizer, special session on “Transport barriers in unsteady fluid flows”, 10th American Institute of Mathematical Sciences conference on Dynamical Systems, Differential Equations and Applications.

    • Session chair, “Chaos, Fractals, and Dynamical Systems I: Lagrangian Coherent Structures", 65th Annual Meeting of the American Physical Society Division of Fluid Dynamics.

    • Co-organizer, special session on “Transport barriers in complex dynamical systems”, 9th American Institute of Mathematical Sciences conference on Dynamical Systems, Differential Equations and Applications.

    • Co-chair, special session on “Recent Advances In Nonlinear Dynamics”, 16th US National Congress of Theoretical and Applied Mechanics.

    • Co-organizer, special session on “Lagrangian Coherent Structures and Invariant Manifolds”, 8th American Institute of Mathematical Sciences conference on Dynamical Systems, Differential Equations and Applications.

- Peer Review for Journals

  Journal of Atmospheric Environment, Chaos, Bulletin of Mathematical Biology, Physics Letter A, IEEE Vis, European Journal of Fluid Mechanics, Continental Shelf Research, Indagationes Mathematicae, Physics of Fluids, Journal of Fluid Mechanics, Remote Sensing, Journal of Hydro-environment Research, Ocean Modeling, European Physics Letters, Journal of Computational Physics, Proceedings of the Royal Socienty A.

- Review for Book Proposals

  • Wiley, "Partial Differential Equations: Theory and Completely Solved Problems"

  • Pearson, graduate level text on Partial Differential Equations

  • Springer, book chapter in "Ergodic Theory, Open Systems, and Coherent Structures"

- **Institutional Level**
  - Aug. 2009 *International Teaching Assistants Orientation*, Panel Member, Arizona State University
  - Jan. 2013 *ASU-Sichuan university cultural exchange program*, hosted Prof. Shilun Li from Sichuan Univ.

- **Unit Level, School of Mathematical & Statistical Sciences**
  - Faculty Search Committee (2010 — 2011).
  - Undergraduate Curriculum Review Committee (2009 — 2010).
  - Colloquium & Distinguished Lecture Committee (2008 — 2010).

OUTREACH

- **Lectures**
  - Nov. 2011 *Lectures on applied linear algebra and on card tricks.* Basis Scottsdale High School, Scottsdale, AZ
  - Sept. 2009 *How mathematics helps us understand the world around us.* Basis Scottsdale High School Invited Speakers Series, Scottsdale, AZ

- **Workshops**

  This 3-day workshop is created to bridge the gap between AP calculus in high school and advanced topics taken in college. High school students (and many lower-level undergraduates) often struggle as they transition from numerical interpretations of mathematical equations to abstract understandings of mathematical concepts. Elementary examples in differential equations and linear algebra are linked to help establish a geometric interpretation of math concepts in applied sciences.

- May 2014 Applied Mathematics/Dynamical Systems Workshop For High School Students, Arizona State University
- May 2013 Applied Mathematics/Dynamical Systems Workshop For High School Students, Arizona State University
- May 2012 Applied Mathematics/Dynamical Systems Workshop For High School Students, Arizona State University
- May 2011 Applied Mathematics/Dynamical Systems Workshop For High School Students, Arizona State University
- July 2010 Applied Mathematics/Dynamical Systems Workshop For High School Students, Arizona State University

- **Highschool Intern Supervision**

  This internship program is created to allow interested students further explore math concepts on dynamics. The high school students work on an applied three-dimensional nonlinear dynamical systems problem over the school year.

  - Lena Tamrat (**African American female**, 10'-11', Biosciences), Ines Ibarra (**Hispanic female**, 09'-10', Biosciences)

- **Judging**

  I sat as a panelist to evaluate internship presentations from high school students at the Biosciences High School in Phoenix, AZ.

  - Apr. 2011 Biosciences High School, Exhibitions of Learning, A Showcase of Student Transdisciplinary Projects.
  - May 2010 Biosciences High School, Exhibitions of Learning, A Showcase of Student Transdisciplinary Projects.

MEDIA EXPOSURE

- Model simulates flow patterns of urban PM, *Environmental Health Perspectives, NIH*, Oct, 2012
- Urban wind flows deposit pollutants in repetitive patterns, *Wired*, Aug. 24th, 2012
- Wind Concentrates Pollutants With Unexpected Order in an Urban Environment, *AIP Newswise*, Aug. 24th, 2012
- The skeleton of water, *The Economist*, Nov. 12th, 2009
- Finding Order in the Apparent Chaos of Currents, *New York Times*, Sept. 28th, 2009

PROFESSIONAL SOCIETIES

- American Physical Society, American Geophysical Union, Society of Industrial and Applied Mathematics