

CURRICULUM VITAE

Yue-Kin Tsang

School of Mathematics and Statistics
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Education

- Ph.D., Physics, University of Maryland, College Park, August 2004
Thesis: *Two-Dimensional Turbulence with Drag*
Advisor: Prof. Edward Ott
- M.Phil., Physics, The Chinese University of Hong Kong, July 1996
Thesis: *Fluctuation Statistics of Scalar Advected by Different Prescribed Velocity Fields*
Advisor: Prof. Emily S.C. Ching
- B.Eng. (Hon.), Electronic Engineering, The Chinese University of Hong Kong, July 1994
Thesis: *Fluorination of $YBa_2Cu_3O_{7-\delta}$* .
Advisor: Prof. S.P. Wong

Employment

- Research Fellow, September 2011 — present
School of Mathematics and Statistics
University of St Andrews
- Research Associate, August 2010 — August 2011
Department of Physics
The Chinese University of Hong Kong
- Postdoctoral Fellow, September 2006 — June 2010
Scripps Institution of Oceanography
University of California, San Diego
- Postdoctoral Fellow, January 2005 — August 2006
Center for Atmosphere Ocean Science
Courant Institute of Mathematical Sciences
New York University
- Research Associate, September 2004 — December 2004
Institute for Research in Electronics and Applied Physics
University of Maryland, College Park

- Research Assistant, September 2000 — August 2004
Department of Physics, University of Maryland, College Park
- Teaching Assistant, September 1998 — May 2004
Department of Physics, University of Maryland, College Park
Duties: *Teaching and grading various undergraduate and graduate physics courses*
- Full-Time Research Assistant, September 1996 — July 1998
Department of Electronic and Information Engineering, The Hong Kong Polytechnic University
Duties: *Research on non-destructive technique (using mathematical modeling and optimization algorithms) for the determination of dispersion profile along an optical fiber; and the dynamics of dispersion managed solitons*
- Teaching Assistant, September 1994 — July 1996
Department of Physics, The Chinese University of Hong Kong
Duties: *Teaching and grading various undergraduate physics courses*
- Summer Research Helper, June 1994 — August 1994
Department of Electronic Engineering, The Chinese University of Hong Kong
Duties: *Experimental studies on the properties of $YBa_2Cu_3O_{7-\delta}F_x$*

Other Experience and Training

- The Hong Kong Institution of Engineers *Structured Training Under Supervision* (a requirement for the IEE Chartered Engineer Qualification):
two-month training course on various practical techniques in electrical and mechanical engineering. (Summer 1991)

Awards and Honors

- *Best Poster Award, 1st Place*, International Conference on Chaos and Nonlinear Dynamics: Dynamics Days 2004, Chapel Hill USA 2004.

Professional Services

- Referee for Physics of Fluids, Physical Review E and IEEE Transactions on Biomedical Engineering

Publications

Journal Papers

1. Emily S.C. Ching and Y.K. Tsang, *Passive scalar conditional statistics in a model of random advection*, Phys. Fluids **9** (5), 1353 (1997)
2. Emily S.C. Ching, C.S. Pang, Y.K. Tsang and X.H. Wang, *Intermittency of a passive scalar advected by a quasifrozen velocity field*, Phys. Fluids **11** (8), 2263 (1999)

3. P.K.A. Wai, F. Moldoveanu, H.H. Chen and Y.K. Tsang, *Nondestructive determination of the longitudinal chromatic dispersion distribution along an optical fiber*, Microw. Opt. Technol. Lett. **30** (5), 312 (2001)
4. Yue-Kin Tsang, Thomas M. Antonsen, Jr., Edward Ott, *Exponential decay of chaotically advected passive scalars in the zero diffusivity limit*, Phys. Rev. E **71**, 066301 (2005)
5. Yue-Kin Tsang, Edward Ott, Thomas M. Antonsen, Jr., Parvez N. Guzdar, *Intermittency in two-dimensional turbulence with drag*, Phys. Rev. E **71**, 066313 (2005)
6. Daniel Birch, Yue-Kin Tsang and William R. Young, *Bounding biomass in the Fisher equation*, Phys. Rev. E **75**, 066304 (2007) (Also selected to appear in the Virtual Journal of Biological Physics Research 13, June 15, 2007, Issue 12)
7. Emily S.C. Ching and Y.K. Tsang, *Multifractality and scale invariance in human heartbeat dynamics*, Phys. Rev. E **76**, 041910 (2007) (Also selected to appear in the Virtual Journal of Biological Physics Research 13, November 1, 2007, Issue 14)
8. William R. Young, Yue-Kin Tsang and Neil J. Balmforth, *Near-inertial parametric subharmonic instability*, J. Fluid Mech. **607**, 25 (2008)
9. Yue-Kin Tsang and William R. Young, *Energy-enstrophy stability of β -plane Kolmogorov flow with drag*, Phys. Fluids **20**, 084102 (2008)
10. Yue-Kin Tsang and William R. Young, *Forced-dissipative two-dimensional turbulence: a scaling regime controlled by drag*, Phys. Rev. E **79**, 045308(R) (2009)
11. Yue-Kin Tsang, *Predicting the evolution of fast chemical reactions in chaotic flows*, Phys. Rev. E **80**, 026305 (2009)
12. Yue-Kin Tsang, *Non-universal velocity probability densities in forced two-dimensional turbulence: the effect of large-scale dissipation*, Phys. Fluids **22**, 115102 (2010)
13. Amir Ali Ahmadi, Yue-Kin Tsang, Edward Ott and Thomas M. Antonsen, Jr., *Relaxation toward homogeneity of chaotically mixed passive scalars: fractal dimensions and strange eigenmodes*, Phys. Rev. E, to be submitted (2010)
14. Yue-Kin Tsang, *Vortex statistics in forced-dissipative two-dimensional turbulence*, J. Fluid Mech., to be submitted (2011)
15. Emily S. C. Ching, Adam T. N. Fok and Yue-Kin Tsang, *Refined similarity hypothesis in Rayleigh-Bénard convection*, in preparation (2011)
16. Yue-Kin Tsang and K. Shafer Smith, *A test of local eddy diffusivity parameterizations in a two-layer isopycnal ocean basin model*, in preparation (2011)

Conference Presentations

1. P.K.A. Wai, H.H. Chen and Y.K. Tsang, *Novel Chromatic Dispersion Determination Along an Optical Fiber*, The Pacific Rim Conference on Laser and Electro-Optics, Chiba Japan, 1997

2. P.K.A. Wai, F. Moldoveanu, H.H. Chen and Y.K. Tsang, *Determination of Optical Fiber Characteristics using Solitons*, Optical Society of America Annual Meeting/ILS-XIII, Long Beach USA, 1997
3. Yue-Kin Tsang, Edward Ott, Thomas M. Antonsen, Jr. and Parvez N. Guzdar, *Two-Dimensional Turbulence with Drag: Wavenumber Energy Spectrum and Intermittency*, International Conference on Chaos and Nonlinear Dynamics: Dynamics Days 2002, Baltimore USA, 2002
4. Yue-Kin Tsang, Edward Ott, Thomas M. Antonsen, Jr. and Parvez N. Guzdar, *Intermittency and Multifractality in Two-Dimensional Turbulence with Drag*, International Conference on Chaos and Nonlinear Dynamics: Dynamics Days 2004, Chapel Hill USA, 2004
5. Yue-Kin Tsang and K. Shafer Smith, *Effective Diffusivities in a Two-layer, Isopycnal, Wind-driven Basin Model*, Meeting on Eddies and Ocean Circulation, MIT, Cambridge, MA USA, 2005
6. Yue-Kin Tsang, Daniel Birch and William R. Young, *Planktonic Population in a Spatially Variable Environment*, International Conference on Chaos and Nonlinear Dynamics: Dynamics Days 2006, Bethesda, MD USA, 2006
7. Amir Ali Ahmadi, Jennifer Rieser, Yue-Kin Tsang, Edward Ott and Thomas M. Antonsen, Jr., *Fractal Patterns in Chaotic Fluid Mixing*, International Conference on Chaos and Nonlinear Dynamics: Dynamics Days 2006, Bethesda, MD USA, 2006
8. Yue-Kin Tsang and K. Shafer Smith, *A Test of Local Effective Diffusivity Parameterization in a Two-Layer, Wind-Driven Isopycnal Primitive Equation Model*, American Geophysical Union Ocean Sciences Meeting, Honolulu, HI USA, 2006
9. Yue-Kin Tsang, Thomas M. Antonsen, Jr. and Edward Ott, *Exponential Decay of Chaotically Advected Passive Scalars in the Zero Diffusivity Limit*, 6th Understanding Complex Systems Symposium, Urbana-Champaign, IL USA, 2006
10. Yue-Kin Tsang and Emily S. C. Ching, *Multifractality in Detrended Human Heart Beat Increment*, International Conference on Chaos and Nonlinear Dynamics: Dynamics Days 2007, Boston, MA USA, 2007
11. Yue-Kin Tsang and William R. Young, *Enstrophy-constrained Stability Analysis of β -plane Kolmogorov Flow with Drag*, American Physical Society March Meeting 2008, New Orleans, LA USA, 2008
12. Yue-Kin Tsang and William R. Young, *Energy-Enstrophy Stability of β -plane Kolmogorov Flow with Drag*, Workshop on Nonlinear Processes in Oceanic and Atmospheric Flows, Castro-Urdiales, Cantabria Spain, 2008
13. Yue-Kin Tsang and William R. Young, *Energy Injection into Two-dimensional Turbulence: a Scaling Regime Controlled by Drag*, American Physical Society Division of Fluid Dynamics 61st Annual Meeting, San Antonio, TX USA, 2008
14. Yue-Kin Tsang and William R. Young, *What Determines the Progress of Fast Chemical Reactions in Chaotic Flows?*, International Conference on Chaos and Nonlinear Dynamics: Dynamics Days 2009, San Diego, CA USA, 2009

15. Yue-Kin Tsang and William R. Young, *Scaling of Energy Injection Rate in Two-dimensional Turbulence with Drag*, Gordon Research Conference on Nonlinear Science, South Hadley, MA USA 2009
16. Yue-Kin Tsang, *Fast Chemical Reactions in Chaotic Flows: Predicting the Product Growth Rate*, American Physical Society Division of Fluid Dynamics 62nd Annual Meeting, Minneapolis, MN USA, 2009
17. Yue-Kin Tsang, *Fast Chemical Reactions in Chaotic Flows: Reaction Rate and Mixdown Time*, IMA Annual Program Year Workshop: Transport and Mixing in Complex and Turbulent Flows, Minneapolis, MN USA, 2010

Teaching Experience

- The Chinese University of Hong Kong
 1. Physics in Meteorology, Spring 2011 (Lecturer)
- University of California, San Diego
 1. Introduction to Applied Mathematics II, Winter 2008
 2. Introduction to Applied Mathematics II, Winter 2007
- New York University
 1. Geophysical Turbulence, Fall 2005 (Guest Lecturer)
- University of Maryland, College Park
 1. Experimental Physics II: Electricity and Magnetism, Spring 2004
 2. General Physics II, Spring 2003
 3. Quantum Mechanics I (graduate level), Fall 2001
 4. Principles of Modern Physics, Spring 2001
 5. Intermediate Theoretical Methods, Spring 2001
 6. Chaotic Dynamics (graduate level), Spring 2000
 7. Intermediate Theoretical Methods, Spring 2000
 8. General Physics II, Fall 1999
 9. Principles of Physics II, Spring 1999
 10. Principles of Physics I, Fall 1998
- The Hong Kong Polytechnic University
 1. Corporate Communication Network (lab session), Spring 1997
- The Chinese University of Hong Kong
 1. Mechanics, Spring 1996
 2. Mechanics, Fall 1995
 3. Perspective in Physics, Fall 1994