Ching-hsiao (Arthur) Cheng（鄭經斅）

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EDUCATION

- **University of California, Davis**, Davis, CA., USA
  Ph.D. in Applied Mathematics, June 2006.
  Advisor: Professor Steve Shkoller
- **National Taiwan University**, Taipei, Taiwan ROC
  Master of Science in Mathematics, July 1997.
  Thesis title: *Geometric measure theoretic properties of sets.*
  Advisor: Professor Fon-Che Liu
- **National Taiwan University**, Taipei, Taiwan ROC
  Bachelor of Science in Mathematics, July 1995.

RESEARCH INTERESTS

Nonlinear Partial Differential Equations
Mathematical fluid dynamics

RESEARCH EXPERIENCE

- **Associate Professor**
  Department of Mathematics, National Central University, Taiwan (Fall 2014 – Present)
  · Research topics: Compressible fluid mechanics, including compressible Navier-Stokes equations with density dependent viscosity and multi-dimensional shocks (under MOST Grant 103-2115-M-008-010-MY2).
- **Assistant Professor**
  Department of Mathematics, National Central University, Taiwan (Fall 2009 – Summer 2014)
  · Research topics: Free boundary problems, including two-phase Hele-Shaw equations, EWOD problems, multi-dimensional shocks (under MOST Grant 98-2115-M-008-006-MY2 and 100-2115-M-008-009-MY3).
- **Research Associate**
  Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland, College Park (Aug 2007 – July 2009):
  · Research topics: Navier-Stokes equations coupled with elastic shells of the Koiter type, motion of the vortex sheets with surface tension (two-phase impressible Euler equations with surface tension on the interface), Hele-Shaw equations, free boundary problems with compressible Euler equations.

  Department of Geology, University of California, Davis (July 2006 – July 2007)
  · Research topics: Modeling the fault motion, friction response, and damage surface evolution, and develop numerical algorithms for the simulation of these phenomena.
- **Research Assistant**
  Department of Mathematics, University of California, Davis (Apr 2002 – Jun 2006)
  · Research topics: Global existence of solutions to Navier-Stokes equation with surface tension, Navier-Stokes equations coupled with elastic bio-fluid shell.

Department of Mathematics, National Taiwan University (Fall 1996 – Summer 1997)

· Geometric measure theory.

TEACHING EXPERIENCE

- **Assistant and Associate Professor**
  National Central University, Taiwan (Fall 2009 – Present)
  · Calculus I, II (MA100x)
  · Advanced Calculus (MA2045)
  · Partial Differential Equations I, II (MA6101, MA6102)
  · Mathematical Fluids Mechanics - Theory and Computations (MA6109, MA6110)
- **Lecturer**
  University of Maryland, College Park (Fall 2007, Spring 2009)
  · Pre-Calculus (MATH115)
  · Multi-variable Calculus (MATH241H)
- **Teaching Assistant**
  University of California, Davis (Fall 2001 – Spring 2006)
  · Analysis (MAT-201)
  · Partial Differential Equations (MAT-218)
  · Ordinary Differential Equations (MAT-022)
  · Linear Algebra (MAT-167)
  · Calculus (MAT-021)

  National Taiwan University, Taipei, Taiwan (Fall 1999 – Summer 2001)
  · Real Analysis (221-U2880)
  · Advanced Calculus (201-21320)
  · Head TA for Calculus

ACADEMIC HONORS

- Top Paper Award（102 學年度理學院頂尖論文）, College of Science, National Central University, Taiwan
- Distinguished Teaching Award（102 學年度優良教師）, College of Science, National Central University, Taiwan
- Young Scholar（2012 年輕理論學者）, National Center of Theoretical Science, Taiwan
- Distinguished Teaching Award（101 學年度優良教師）, College of Science, National Central University, Taiwan
- Outstanding Advisor（100 學年度優良導師）, College of Science, National Central University, Taiwan
- Outstanding Advisor（99 學年度優良導師）, College of Science, National Central University, Taiwan
- Top Paper Award（99 學年度理學院頂尖論文）, College of Science, National Central University, Taiwan

PUBLICATION

- C.H. Arthur Cheng and Steve Shkoller, "Global existence and decay for solutions of the Hele-Shaw flow with injection", *Interfaces and Free Boundaries,* **16**(3), (2014), 297-338.
- Te-Yuan Chung, Yu-Hua Hsieh, Chi-Chun Liao and Ching-Hsiao Arthur Cheng, "Transverse modes of a laser using VBG as the cavity mirror", *Optics Letters,* **38**(24), (2013), 5346–5348.
- C.H. Arthur Cheng, Ying-Chieh Lin and Cheng-Fang Su, "The well-posedness of 2-dimensional incompressible Navier-Stokes equations with surface tension in an optimal Sobolev space", submitted in 2013

- C.H. Arthur Cheng and Steve Shkoller, "The stability of the Hele-Shaw flow without surface tension", submitted in 2013
- C.H. Cheng, D. Coutand and S. Shkoller, "Global existence and decay for solutions of the Hele-Shaw flow with injection", submitted in 2012
- C.H. Arthur Cheng, Steve Shkoller, "The interaction of the 3D Navier-Stokes equations with a moving nonlinear Koiter elastic shell", *SIAM J. Math. Anal.,* **42**(3), (2010), 1094–1155.
- C.H. Arthur Cheng and Steve Shkoller, "On the limit as the density ratio tends to zero for two perfect incompressible 3-D fluids separated by a surface of discontinuity", *Comm, Partial Differential Equations,* **35***,* (2010), 817–845.
- C.H. Arthur Cheng, Louise H. Kellogg, Steve Shkoller and Donald .L. Turcotte, "A liquid crystal model for friction", *Proc. Nat'l Acad. Sci. USA,* **105***,* (2008), 7930–7935.
- C.H. Cheng, D. Coutand and S. Shkoller, "On the Motion of Vortex Sheets with Surface Tension in the 3D Euler Equations with Vorticity" *Comm. Pure Appl. Math.,* **61**(12), (2008), 1715–1752.
- C.H. Arthur Cheng, Daniel Coutand, and Steve Shkoller, "Navier-Stokes equations interacting with a nonlinear elastic biofluid shell" *SIAM J. Math. Anal.,* **39** *,* (2007), 742–800.

Conference Talk

- International Conference on Free Boundary Problems: Theory and Applications, 2014
- The 21st Annual Workshop of Differential Equations in Taiwan, 2013
- Mathematical Conference and Annual Meeting of the Taiwan Mathematical Society, 2012
- NCTS Workshop on Theoretical and Computational Challenges on PDEs, 2012
- NCTS-POSTECH Joint Workshop on PDE, 2012
- NCTS Summer Course on Fluid Dynamics, 2012
- NCTS Workshop on Fluid-Structure Interaction Problems, 2011
- Fourth Workshop on Nonlinear Partial Differential Equations: Analysis, Computation and Applications, 2010
- Fourth Trilateral Metting on Analysis and Applications "Australia-Italy-Taiwan", 2009
- AMS Sectional PDE Seminar in San Francisco, 2006
- AGU Fall Meeting in San Francisco, 2006

Grants

- **MOST Grant 103-2115-M-008-010-MY2** from Ministry of Science and Techonology, Taiwan, Aug. 2014 – Jul. 2016
- **NSC Grant 100-2115-M-008-009-MY3** from National Science Council, Taiwan, Aug. 2011 – Jul. 2014
- **NSC Grant 98-2115-M-008-006-MY2** from National Science Council, Taiwan, Nov. 2009 – Jul. 2011

Reference

Available on request.