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education

1990 – 1995 **THE UNIVERSITY OF CHICAGO** **CHICAGO, IL**
Ph. D. in Physics (March 1995), GAANN Graduate Fellowship of the University of Chicago (1990-1993)

1986 – 1990 **HARVARD COLLEGE** **CAMBRIDGE, MA**
Bachelor degree in Physics (June 1990), ***magna cum laude***, completed first-year graduate courses in Physics as senior undergraduate

experience

1997 – 2000 **COLUMBIA UNIVERSITY, ASTRONOMY DEPARTMENT** **NEW YORK, NY**
1/00 – Now **Adjunct Assistant Professor**
- Introduced web presence into upper-level undergraduate course on "Planetary Dynamics and Physics of the Solar System"
- Updated the curriculum of "Planetary Dynamics" to include recent discovery of extrasolar planets
- Coordinated survey on misconceptions of the phases of the moon, enabled survey to be taken over the web

6/97 – 12/99 **National Science Foundation Postdoctoral Research Fellow**
- Awarded by the Mathematical Sciences Division of the National Science Foundation in a highly competitive, annual proposal competition
- Designed algorithms for numerical simulations of radiative fluid dynamics
- Devised iterative and continuation techniques for nonlinear stability analysis of shear flow
- Introduced parametric eigenvalue analysis to models of stellar atmospheres
- Collaborated with polymer physicists to extend level-set methods to ternary-fluid domain-growth problems

Fall 1998 **THE COOPER UNION** **NEW YORK, NY**
9/98 – 12/98 **Adjunct Professor of Physics**
- Pioneered curriculum of General Relativity course for Cooper Union engineering undergraduates

1995 – 1997 **UNIVERSITY OF CAMBRIDGE** **CAMBRIDGE, UK**
4/95 – 4/97 **Postdoctoral Research Assistant at the Department of Applied Mathematics and Theoretical Physics**
- Designed algorithm for massively-parallel numerical simulations of solar fluid dynamics.
- Simulated, analyzed, and modeled the effective transport properties of turbulent convection
- Extended multifractal dimensional analysis to random fractals

1990 – 1995 **THE UNIVERSITY OF CHICAGO** **CHICAGO, IL**
9/90 – 3/95 **Research Assistant at the Department of Physics and the Department of Astronomy and Astrophysics**
- Engaged in collaborative research in astrophysical magnetohydrodynamics (MHD)
- Systematized large-scale numerical code on Cray supercomputers for MHD simulations
- Analyzed fractal properties of solar surface magnetic fields and related the fractal spectrum to transport properties of the solar convection zone

computation

Scientific Computing
- Large-scale Computational Fluid Dynamics (CFD) on workstations and supercomputers (both serial and parallel)
- Numerical solutions to Partial Differential Equations (PDEs)
- Analytical and numerical methods of bifurcation theory
- Computational eigenvalue and spectral analysis
- Iterative and continuation techniques for numerical stability analysis
- Numerical modeling and analysis of nonlinear dynamical systems
- Languages: FORTRAN 77, IDL, MATLAB (on Unix workstations and PCs)

languages

Chinese (fluency in reading and speaking Mandarin)

hobbies

Music (opera and classical), Squash, Table Tennis, Softball (manager of the Columbia Astronomy intramural team)

publications

Some recent academic publications:

- K.A. Smith, F.J. Solis, L. Tao, K. Thornton, and M. Olvera de la Cruz, "Domain Growth in Ternary Fluids: A Level-Set Approach", *Physical Review Letters* **84**, 91 (2000)
- E.A. Spiegel, and L. Tao, "Photofluid Instabilities of Hot Stellar Envelopes", *Physics Reports* **311**, 163 (1999)
- O.M. Umurhan, L. Tao, and Spiegel, E.A. "Stellar Oscillons", *Annals of the New York Academy of Sciences* **867**, 298 (1999)
- F.J. Solis, and L. Tao, "Lacunarity of Random Fractals", *Physics Letters* A**228**, 351 (1997)