

# Chris Stucchio

## Courant Institute of Mathematical Science

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U.S. Citizen - Available to Work

## Research

Phase Space methods in Numerical Analysis, Image processing (medical and other), Exponential Asymptotics, Nonlinear Optics

## Education

**Ph.D. in Mathematics, Rutgers University**, Piscataway, NJ — Jan 2008.

Advisers: Avy Soffer and Ovidiu Costin

**B.S. Math and Physics, Stevens Institute of Technology**, Hoboken, NJ — May 2002

## Employment

**Quantitative Developer (Consultant)**, Trading Games Inc., Aug 2009-Present

**Postdoctoral Scholar**, Courant Institute, New York University, 2007-Present

**Teaching Assistant**, Rutgers University, 2002-2007, 9/2004-5/2006

**Research Mentor**, DIMACS Research Experience for Undergraduates, Summer 2004-2006

## Honors

National Science Foundation Research Fellowship, 2007 (Declined)

Bevier Fellowship, 2006

## Publications

1. *Temporal dynamics of tunneling. Hydrodynamic approach*, with G. Dekel, V. Fleurov and A. Soffer. Physical Review A, Vol.75, No.4, April 2007. [arxiv.org/abs/cond-mat/0608452](http://arxiv.org/abs/cond-mat/0608452)
2. *Open Boundaries for the Nonlinear Schrodinger Equation*, with A. Soffer. Journal of Computational Physics Volume 225, Issue 2, 2007, p.p. 1218-1232, [arxiv.org/abs/math/0609183](http://arxiv.org/abs/math/0609183).
3. *Ionization in a 1-Dimensional Dipole Model*, with O. Costin and J. L. Lebowitz. Reviews in Mathematical Physics, Vol. 20, Issue 7, Aug 2008, p.p. 835-872, [arxiv.org/abs/math-ph/0609069](http://arxiv.org/abs/math-ph/0609069).
4. *Time Dependent Phase Space Filters: Nonreflecting Boundaries for Semilinear Schrodinger Equations*, with A. Soffer (Preprint, 115 pages).
5. *Multiscale Resolution of Shortwave-Longwave Interaction*, with A. Soffer. Communications in Pure and Applied Mathematics, Volume 62, Issue 1, January 2009, p.p. 82-124, [arxiv.org/abs/0705.3501](http://arxiv.org/abs/0705.3501).
6. *Exact Results for Ionization of Model Atomic Systems*, with O. Costin, J.L. Lebowitz and S. Tanveer. Submitted, [arxiv.org/abs/0708.0635](http://arxiv.org/abs/0708.0635).
7. *Observation of Soliton Tunneling Phenomena and Soliton Ejection*, with A. Barak, O. Peleg, A. Soffer and M. Segev, Physical Review Letters, Vol. 100, 153901 (2008).

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8. *Wave Collapse Doesn't Matter*, with J. Frohlich, I.M. Sigal and A. Soffer. (In preparation).
9. *Stable Open Boundaries for Anisotropic Waves*, with A. Soffer. Submitted, [arxiv.org/abs/0805.2929](http://arxiv.org/abs/0805.2929).
10. *Curve Reconstruction from Points and Tangents*, with L. Greengard. Submitted, [arxiv.org/abs/0903.1817](http://arxiv.org/abs/0903.1817).
11. *Spectral edge detection in two dimensions using wavefronts*, with L. Greengard. Accepted by Applied and Computational Harmonic Analysis, [arxiv.org/abs/0909.5453](http://arxiv.org/abs/0909.5453).
12. *Reconstructing curves with sharp corners using tangential information*, with L. Greengard. (In preparation).
13. *Reconstruction of Piecewise Constant functions from Low Frequency Spectral Data*, with L. Greengard. (In preparation.)

## Recent Talks

1. Imaging Seminar, MIT, Cambridge, MA, March 2010
2. Mathematical Physics Seminar, Rutgers University, Piscataway, NJ Dec 2009
3. Workshop on Quantum Control, Wolfgang Pauli Institute, Vienna, Feb 2009
4. SIAM Annual Meeting, San Diego, CA, June 2008
5. Frontiers in Applied and Computational Mathematics, Newark, NJ, May 2008
6. University of Chicago Applied Mathematics Seminar, Chicago, IL, Nov 2007
7. SIAM Conference on Dynamical Systems, Snowbird, UT, June 2007
8. Princeton Mathematical Physics Seminar, Princeton, NJ, April 2007

## Software Skills

Languages: Python, C++, Emacs Lisp, Scheme, Haskell and Javascript.

Operating Systems: Linux, OS X, Emacs

Applications/Libraries/Frameworks: Boost, STL, Numpy/Matplotlib, webpy, django, Traits and PyGTK, Latex, darcs, Mercurial, misc. unix skills (shell scripting, make, etc), HTML/CSS, webgen

Code samples available from my webpage.

## References

Leslie Greengard, Ovidiu Costin, Joel Lebowitz and Avy Soffer