

PHILIP T. GRESSMAN
SHORT CURRICULUM VITAE
(LAST UPDATED APRIL 1, 2015)

CONTACT INFORMATION

Department of Mathematics
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CITIZENSHIP: US

RESEARCH INTERESTS: harmonic analysis and PDEs, geometric combinatorics, geometric analysis

EMPLOYMENT HISTORY

| | | |
|-----------------------|--------------------------------------|----------------------------|
| July 2014 - present | Professor | University of Pennsylvania |
| July 2011 - June 2014 | Associate Professor | University of Pennsylvania |
| July 2008 - June 2011 | Assistant Professor | University of Pennsylvania |
| July 2005 - June 2008 | J. W. Gibbs Assistant Professor | Yale University |
| | Postdoctoral advisor: Peter W. Jones | |

EDUCATIONAL HISTORY

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|---|-------------------------|
| Ph.D. Princeton University | August 2001 - May 2005 |
| Thesis title: “ $L^p - L^q$ estimates for Radon-like operators” | |
| Thesis advisor: Elias M. Stein | |
| A.B. Washington University in St. Louis | August 1997 - June 2001 |
| <i>Summa cum laude</i> with majors in mathematics and physics | |

MANUSCRIPTS AND PUBLICATIONS

1. “Fourier restriction for quadratic submanifolds of maximal codimension,” *in preparation*.
2. “ L^p -improving averages over 2-surfaces in \mathbb{R}^5 ,” *in preparation*.
3. “On the decay of certain trilinear oscillatory integral operators,” with L. Xiao, *in preparation*.
4. “Damping oscillatory integrals by the Hessian determinant via Schrödinger,” *submitted*.
5. “An operator van der Corput estimate arising from oscillatory Riemann-Hilbert problems,” with Y. Do, *to appear in J. Func. Anal.*
6. “ L^p -nondegenerate Radon-like operators with vanishing rotational curvature,” *to appear in Proc. AMS*.
7. “On the uniqueness of solutions to the periodic 3D Gross-Pitaevskii hierarchy,” with V. Sohinger and G. Staffilani, *J. Func. Anal* **266** (2014), no. 7, 4705–4764.
8. “Scalar oscillatory integrals in smooth spaces of homogeneous type.” *to appear in Rev. Mat. Ibero*.
9. “A non-local inequality and global existence,” with R. M. Strain and J. Krieger, *Adv. Math.* **230** (2012) 642–648.

10. “Fractional Poincaré and logarithmic Sobolev inequalities for measure spaces,” *J. Func. Anal.* **265** (2013), no. 6, 867–889.
11. “Uniform sublevel Radon-like inequalities,” *J. Geom. Anal.* **23** (2013), no. 2, 611–652.
12. “Sharp anisotropic estimates for the Boltzmann collision operator and its entropy production,” with R. M. Strain, *Adv. Math.* **227** (2011), no. 6, 2349–2384.
13. “Global classical solutions of the Boltzmann equation without angular cut-off,” with R. M. Strain, *J. Amer. Math. Soc.* **24** (2011), 709–769.
14. “Global classical solutions of the Boltzmann equation with long-range interactions,” with R. M. Strain, *PNAS*, **107** (2010), no. 13, 5744–5749.
15. “On multilinear determinant functionals,” *Proc. AMS*, **139** (2011), 2473–2484.
16. “Uniform geometric estimates for sublevel sets,” *J. d’Analyse Math.*, **115** (2011), 251–272.
17. “ L^p -improving properties of averages on polynomial curves and related integral estimates,” *Math. Res. Lett.*, **16** (2009), no. 6, 971–989.
18. “Rank and regularity for averages over submanifolds,” *J. Func. Anal.*, **257** (2009), no. 5, 1396–1428.
19. “Radon-like operators and rank conditions,” *Oberwolfach Reports*, **32** (2008), 1813–1817.
20. “Uniform estimates for cubic oscillatory integrals,” *Indiana U. Math. J.*, **57** (2008), 3419–3442.
21. “Sharp $L^p - L^q$ estimates for generalized k -plane transforms,” *Adv. Math.*, **214** (2007), no. 1, 344–365.
22. “ L^p -improving properties of X-ray like transforms,” *Math. Res. Lett.*, **13** (2006), no. 5-6, 787–803.
23. “Regularity of the Fourier transform on spaces of homogeneous distributions,” with E. M. Stein, *J. d’Analyse Math.*, **100** (2006), 211–222.
24. “Convolution and fractional integration along homogeneous curves in \mathbf{R}^n ,” *Math. Res. Lett.* **11** (2004), no. 5-6, 869–881.
25. “Affine, quasi-affine, and co-affine wavelets,” with D. Labate, G. Weiss, and E. Wilson, *Beyond Wavelets*, G. Welland, ed. (2003).
26. “Wavelets on the integers,” *Collect. Math.* **52** (2001), no. 3, 257–288.
27. “Towards a realistic neutron star binary inspiral: Initial data and multiple orbit evolution in full general relativity,” with M. Miller and W.-M. Suen, *Phys. Rev. D* **69** (2004), 064026.
28. “Head-on/near head-on collisions of neutron stars with a realistic equation of state,” with E. Evans, A. Gopakumar, S. Iyer, M. Miller, W.-M. Suen, and H.-M. Zhang, *Phys. Rev. D* **67** (2003), 104001.

29. “Nonlinear r-modes in neutron stars: Instability of an unstable mode,” with L.-M. Lin, W.-M. Suen, N. Stergioulas, and J. L. Friedman, *Phys. Rev. D* **66** (2002), 041303.

GRANTS, FELLOWSHIPS, AND OUTSIDE FUNDING

Alfred P. Sloan Research Fellowship, 2011–2013 (extended 2013–2015)
NSF Grant DMS-1361697, 2014–17
NSF Grant DMS-1101393, 2011–14
NSF Grant DMS-0850791, 2008–11
NSF Grant DMS-0653755, 2006–08

OTHER PRIZES AND AWARDS

UPenn Departmental Teaching Awards Fall 2008, Fall 2011, Spring 2012, Fall 2013, Spring 2014
National Science Foundation Postdoctoral Fellowship, 2005 (declined)
National Science Foundation Graduate Research Fellowship, 2001
Barry M. Goldwater Fellowship, 2000
Astronaut Foundation Scholarship, 2000

WORKSHOPS ORGANIZED, GRANT PANELS, ETC.

Graduate Mentoring Workshop, Tufts/MIT, April 2015
AIM Workshop: “Carleson theorems and multilinear operators,” May 2015, co-organized with
Lillian Pierce, Victor Lie, and Po Lam Yung
NSF Panelist
NSERC (Canada) Referee 2011

UPCOMING TALKS OR OTHER

Princeton University Analysis Seminar, April 2015
Minicourse on Oscillatory Integrals and Geometric Interactions, Aalto U., Finland, June 2015
George Boole Mathematical Sciences Conference 2015, Cork, Ireland, August 2015

RECENT TALKS, WORKSHOPS, MINICOURSES

Brown University Analysis Seminar, March 2015
ICM Satellite Conference in Harmonic Analysis, South Korea, August 2014
Oberwolfach: “Real Analysis, Harmonic Analysis and Applications,” July 2014
UPenn Math Teaching Brown Bag Meeting, June 2014
IPAM: “The Kakeya problem, Restriction Problem, and Sum-Product Theory,” May 2014
UPenn Graduate Student Flyout Weekend, March 2014
University of Wisconsin: Harmonic Analysis RTG Meeting (2 lecture series), November 2013
UPenn Math Teaching Brown Bag Meeting, July 2013
Yale Analysis Seminar, April 2013
University of Birmingham (UK) Analysis Seminar, March 2013
Minicourse: Harmonic Analysis and the Boltzmann Equation, FIM @ ETH, March 2013
University of Wisconsin Analysis Seminar, February 2013
Perspectives in HA, GMT, and PDE, and appl. to SCV, Temple U., September 2012
9th Internat. Conf. on Harmonic Analysis and PDEs, El Escorial, June 2012 (short talk)
Temple University Colloquium, April 2012
Courant Institute Colloquium, March 2012
UPenn Graduate Student Pizza Seminar, November 2011

WHAPDE 2011, Mexico City, October 2011
Workshop on Oscillatory Integrals in Harmonic Analysis, ICM, Edinburgh, June 2011
University of Maryland Analysis/PDE Seminar, October 2010
ICM Satellite Conference in Harmonic Analysis, Bhubaneswar, August 2010
MIT PDE/Analysis Seminar, March 2010
University of Wisconsin Analysis Seminar, February 2010

OUTREACH

Selected to represent the American Mathematical Society at the 19th Annual Coalition for National Science Funding (CNSF) Capitol Hill Exhibition, May 2013. Activities involved meeting with congressional representatives to discuss the importance of national science funding for pure and applied mathematics and a poster session for the members and their staff people. The topic of the poster presented was the joint work on the Boltzmann equation with R. M. Strain. Following the exhibition, on June 12, 2013, Rep. Jerry McNerney (D-CA) gave a brief speech on the floor of the House of Representatives about the research.

RECENT COURSES TAUGHT

Spring 2015: MATH 241 Calculus IV, MATH 648 Topics in Analysis: Harmonic Analysis
Fall 2014: MATH 240 Calculus III
Spring 2014: MATH 609 Real Analysis, MATH 584 Math. of Medical Imaging
Fall 2013: MATH 360 Advanced Calculus I
Fall 2012: MATH 584, MATH 241 Calculus IV

DEPARTMENT AND UNIVERSITY SERVICE

Math Department Calculus Diagnostic Exam Committee: 2012–2013
Math Department Curriculum Revision Committee MATH 241: Spring 2012 (chair)
Math Department TA Recruitment Committee: 2014–2015 (chair)
Math Department Personnel Committee: 2011–2012, 2014–2015
Math Department Personnel Subcommittees (various): 2013–2014, 2014–2015
Math Department Graduate Advising Committee: 2011–2012, 2013–2014
SAS Freshman Academic Advising: Fall 2009 to present
Math Department Undergraduate Curriculum Committee: 2009–2010, 2012–2013
Math Department Preliminary Exam Committee: 2008–2009, 2013–2014 (chair)
Math Department Colloquium Committee: 2008–2009, 2010–2011, 2012–2013 (chair)
Math Major Advising Committee: 2009–2010, 2010–2011, 2013–2014
SAS NSF Outreach Meetings: 2008–2009

OTHER

Referee for Adv. Math., J. Fourier Anal. and Appl., J. Func. Anal., J. London Math. Soc., Math. Res. Lett., Proc. Amer. Math. Soc., Revista Mat. Iberoamericana, J. Math. Anal. and Appl., Reviewer for Mathematical Reviews