

**CURRICULUM VITAE**  
PHILIP T. GRESSMAN  
(LAST UPDATED AUGUST 19, 2013)

**CONTACT INFORMATION**

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**CITIZENSHIP:** US

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

**EMPLOYMENT HISTORY**

July 2011 - present	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**

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. "On oscillatory integrals and the Curved Box Lemma of Phong and Stein," *in preparation*.
2. "An operator van der Corput estimate arising from oscillatory Riemann-Hilbert problems," with Y. Do, *submitted*.
3. " $L^p$ -nondegenerate Radon-like operators with vanishing rotational curvature," *submitted*.
4. "On the uniqueness of solutions to the periodic 3D Gross-Pitaevskii hierarchy," with V. Sohinger and G. Staffilani, *submitted*.
5. "Scalar oscillatory integrals in smooth spaces of homogeneous type." *submitted*.
6. "A non-local inequality and global existence," with R. M. Strain and J. Krieger, *Adv. Math.* **230** (2012) 642–648.
7. "Fractional Poincaré and logarithmic Sobolev inequalities for measure spaces," *J. Func. Anal.* **265** (2013), no. 6, 867–889.
8. "Uniform sublevel Radon-like inequalities," *J. Geom. Anal.* **23** (2013), no. 2, 611–652.
9. "Sharp anisotropic estimates for the Boltzmann collision operator and its entropy production," with R. M. Strain, *Adv. Math.* **227** (2011), no. 6, 2349–2384.
10. "Global classical solutions of the Boltzmann equation without angular cut-off," with R. M. Strain, *J. Amer. Math. Soc.* **24** (2011), 709–769.

11. “Global classical solutions of the Boltzmann equation with long-range interactions,” with R. M. Strain, *PNAS*, **107** (2010), no. 13, 5744–5749.
12. “On multilinear determinant functionals,” *Proc. AMS*, **139** (2011), 2473–2484.
13. “Uniform geometric estimates for sublevel sets,” *J. d’Analyse Math.*, **115** (2011), 251–272.
14. “ $L^p$ -improving properties of averages on polynomial curves and related integral estimates,” *Math. Res. Lett.*, **16** (2009), no. 6, 971–989.
15. “Rank and regularity for averages over submanifolds,” *J. Func. Anal.*, **257** (2009), no. 5, 1396–1428.
16. “Radon-like operators and rank conditions,” *Oberwolfach Reports*, **32** (2008), 1813–1817.
17. “Uniform estimates for cubic oscillatory integrals,” *Indiana U. Math. J.*, **57** (2008), 3419–3442.
18. “Sharp  $L^p - L^q$  estimates for generalized  $k$ -plane transforms,” *Adv. Math.*, **214** (2007), no. 1, 344–365.
19. “ $L^p$ -improving properties of X-ray like transforms,” *Math. Res. Lett.*, **13** (2006), no. 5-6, 787–803.
20. “Regularity of the Fourier transform on spaces of homogeneous distributions,” with E. M. Stein, *J. d’Analyse Math.*, **100** (2006), 211–222.
21. “Convolution and fractional integration along homogeneous curves in  $\mathbf{R}^n$ ,” *Math. Res. Lett.* **11** (2004), no. 5-6, 869–881.
22. “Affine, quasi-affine, and co-affine wavelets,” with D. Labate, G. Weiss, and E. Wilson, *Beyond Wavelets*, G. Welland, ed. (2003).
23. “Wavelets on the integers,” *Collect. Math.* **52** (2001), no. 3, 257–288.

#### GRANTS, PRIZES, AND AWARDS

Alfred P. Sloan Research Fellowship, 2011–2013  
 NSF Grants DMS-1101393 (2011–14), DMS-0850791 (2008–11), DMS-0653755 (2006–08)  
 UPenn Departmental Teaching Awards Fall 2008, Fall 2011, Spring 2012  
 National Science Foundation Postdoctoral Fellowship, 2005 (declined)  
 National Science Foundation Graduate Research Fellowship, 2001  
 Barry M. Goldwater Fellowship, 2000  
 Astronaut Foundation Scholarship, 2000

#### UPCOMING MEETINGS

Oberwolfach: “Real Analysis, Harmonic Analysis and Applications,” July 2014  
 IPAM: “The Kakeya problem, Restriction Problem, and Sum-Product Theory,” May 2014  
 University of Wisconsin: Harmonic Analysis RTG Meeting, November 2013

#### PAST TALKS, ETC.

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  
 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  
 University of Arkansas Spring Lecture Series, April 2009  
 Johns Hopkins University Analysis Seminar, March 2009  
 University of Edinburgh Analysis Seminar, October 2008  
 AMS Regional Meeting, Vancouver, BC, October 2008  
 Oberwolfach Workshop “Real Analysis, Harmonic Analysis and Applications,” July 2008  
 Brown University Analysis Seminar, April 2008  
 Fields Institute Workshop “Current Trends in Harmonic Analysis,” February 2008  
 University of Pennsylvania Analysis Seminar, January 2008  
 University of Virginia Special Colloquium, January 2008  
 Lehman College, CUNY, December 2007  
 University of Massachusetts at Amherst Colloquium, December 2007  
 Georgia Institute of Technology, December 2007  
 Concordia / McGill Analysis Seminar, November 2007  
 New Mexico Analysis Seminar / AMS Regional Meeting, October 2007  
 University of Rochester Analysis Seminar, October 2007  
 Georgia Institute of Technology Analysis Seminar, October 2007  
 Harmonic Analysis with Applications to PDE (ICM satellite), Sevilla, August 2006  
 Yale Analysis Seminar, October 2005  
 UCLA Analysis Seminar, January 2005  
 University of Illinois at Urbana-Champaign Special Colloquium, January 2005  
 Special Trimester on Harmonic Analysis, Scuola Normale, Pisa, May 2004  
 Princeton Mathematics Graduate Student Seminar, March 2003  
 DIMACS Conference on Analysis with Wavelets, Signals and Geometry, April 2001

#### **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.

#### **TEACHING**

UPenn MATH 103 Introduction to Calculus (Spring 2010)  
 UPenn MATH 104 Calculus I (Spring 2011)

UPenn MATH 170 Ideas in Mathematics (Spring 2009)  
UPenn MATH 210 Mathematics in the Age of Information (Fall 2009)  
UPenn MATH 240 Calculus III (Spring 2012)  
UPenn MATH 241 Calculus IV (Fall 2012)  
UPenn MATH 410 Introduction to Complex Analysis (Fall 2010)  
UPenn MATH 512 Advanced Linear Algebra (Fall 2008, Spring 2011)  
UPenn MATH 499 Independent Study in PDE (Fall 2009)  
UPenn MATH 584 Math. of Medical Imaging (Fall 2008, Fall 2009, Fall 2012)  
UPenn MATH 608-609 Analysis (Fall 2011/Spring 2012)  
Yale MATH 120 Multivariable Calculus (Fall 2006)  
Yale MATH 230 Vector Calculus and Linear Algebra (Spring 2006)  
Yale MATH 246 Ordinary Differential Equations (Spring 2008)  
Yale MATH 305 Real Analysis (Spring 2007, Spring 2008)  
Yale MATH 315b/515b Intermediate Complex Analysis (Spring 2006)  
Yale MATH 744 Intro. to Fourier Analysis on Euclidean Spaces (Fall 2006, Fall 2007)  
Princeton MATH 330 Topics in Analysis (Spring 2005, half-time lecturer)  
Princeton MATH 333 Topics in Analysis (Fall 2004, half-time lecturer)

#### **DEPARTMENT AND UNIVERSITY SERVICE**

Math Department Curriculum Revision Committee MATH 241: Spring 2012 (chair)  
Math Department Personnel Committee: 2011–2012  
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)  
AMCS Colloquium Committee: 2013–2014  
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