

Azita Mayeli - Curriculum Vitae - Feb. 2015

Mathematics & Computer Science Department, Queensborough Community College
and Doctoral Faculty at the Graduate Center, CUNY
Email: amayeli@qcc.cuny.edu

Professional Preparation

May 2014 - present Doctoral Faculty, CUNY, the Graduate Center.
2011 - present Assistant Professor, CUNY, Queensborough Community College.
2009 - 2011 Visiting Assistant Professor, CUNY, New York College of Technology.
2008 - 2009 Postdoc at Stony Brook University, SUNY.
January - March 2008 Postdoc at the Fields Institute, University of Toronto, Canada.
2006 - 2009 Marie Curie Research Fellow at the National Research Center for Environment and Health Center, Munich, Germany.
2002 - 2006 Ph.D. candidate (with full scholarship from the German government), Technischen Universität München (TUM), Germany.
Specialization: “Wavelet and frame analysis on the Heisenberg group” .

Graduate advisor and co-advisor

Günter Schlichting (TUM, Germany), Hartmut Führ (RWTH Aachen, Germany)

Postdoctoral mentor

Daryl Geller, Stony Brook University, SUNY

Special Appointments

2008 Research scholarship from Technischen Universität München, Germany
2007 Research scholarship from Stony Brook University
2007 Research scholarship from Texas A&M University
2006 Research fellow at Technical University of Denmark
2002-2006 Ph.D. full scholarship from DAAD (The German Academic Exchange Service)

Selected publications

1. Bradley Currey, Azita Mayeli, Vignon Oussa, *Sampling and Interpolation on Certain Nilpotent Lie Groups*, to appear in IEEE Sampling, 2015.
2. Azita Mayeli, *Identification of Besov spaces via Littlewood-Paley-Stein g -type functions*, accepted in the Proceeding of the American Mathematical Society.
3. Alex Iosevich, Azita Mayeli, *Exponential bases, Paley-Wiener spaces, and applications*; Journal of Functional Analysis, Volume 268, Issue 2, 15 January 2015, Pages 363–375.
4. Azita Mayeli, *A unified approach for Littlewood-Paley decomposition of abstract Besov spaces*; to appear in Proceeding of the American Mathematical Society, ID PROC12485. ISSN 1088-6826(online) ISSN 0002-9939 (print)

5. D. Barbier, E. Hernandez, A. Mayeli, *Bracket map for Heisenberg group and the characterization of cyclic subspace*, Applied and Computational Harmonic Analysis, 37(2), 218–234, 2014.
6. Azita Mayeli, Vignon Oussa, *Regular Representations of Time-Frequency Groups*; Mathematische Nachrichten, Volume 287, Issue 11-12, pages 1320–1340, 2014.
7. B. Currey, A. Mayeli, V. Oussa, Characterization of shift-invariant spaces on a class of nilpotent Lie groups with application, J. of Fourier Analysis and Applications, 2014, Vol. 20, Issue 2, pp 384-400.
8. Azita Mayeli, Mohammad Razani, *Multiplexing and demultiplexing Frame Pairs*; AMS, Contemporary Mathematics, Vol. 603, 2013.
9. Bradley Currey, Azita Mayeli, *The orthonormal dilation property for abstract Parseval wavelet frames*; Canadian Mathematical Bulletin, 56 (2013), 729–736.
10. Hartmut Führ, Azita Mayeli, *Homogeneous Besov spaces on stratified Lie groups and their wavelet characterization*; The Journal of Function Spaces and Applications, Volume 2012 (2012).
11. Jens Christensen, Azita Mayeli, Gestur Ólafsson, *Coorbit description and atomic decomposition of Besov spaces*; Numerical Functional Analysis and Optimization, Volume 33, Issue 7–9, 2012.
12. Jens Christensen, Azita Mayeli, Gestur Ólafsson, *Coorbit description and atomic decomposition of Besov spaces*; Numerical Functional Analysis and Optimization, Volume 33, Issue 7–9, 2012.
13. Sandro Scodeller, Øystein Rudjord, Frode Kristian Hansen, Dominico Marinucci, Darly Geller, Azita Mayeli, *Introducing Mexican needlets for CMB analysis: Issues for practical applications and comparison with standard needlets*; Astrophysical Journal Vol. 733, No. 2, (2011).
14. Bradley Currey, Azita Mayeli, *Gabor fields and wavelet sets for the Heisenberg group*; Monatshefte für Mathematik (2011), 162:119–142.
15. Darly Geller, Azita Mayeli, *Nearly tight frames for spin wavelets on the sphere*; Sampling Theory and Signal Image Process, 9 (2010), 25–57.
16. Azita Mayeli, *Asymptotic uncorrelation for generalized mexican needlets*; Journal of Mathematical Analysis and Applications (2010), Pages 336–34.
17. Daryl Geller, Azita Mayeli, *Besov spaces and frames on compact manifolds*; Indiana University Mathematics Journal, Vol. 58, No. 5, 2009.
18. Daryl Geller, Azita Mayeli, *Nearly tight frames and space-frequency analysis on compact manifolds*; Mathematische Zeitschrift, 236 (2009), no. 2, 235–264.
19. Daryl Geller, Azita Mayeli, *Continuous wavelets on compact manifolds*; Mathematische Zeitschrift, 262 (2009), no. 4, 895–927.
20. *Shannon multiresolution analysis on the Heisenberg group*; J. Math. Anal. Appl. 348 (2), 671–684, (2008)

21. Daryl Geller, Azita Mayeli, *Continuous wavelets and frames on stratified Lie groups I.*; J. Fourier Anal. Appl. 12 (5), 543–579, (2006)
22. Continuous and Discrete Wavelet Transformations on the Heisenberg Group; Ph.D thesis, 2006.

Scholarships, Grants, Awards, and honors - selective

1. PI, NSF conference grant, \$49,704, DMS-1501066, 2015-2016.
2. Honored by the Chancellor and the Vice Chancellor of the CUNY for outstanding scholarly achievements, 2015.
3. PI, The Professional Staff Congress - City University of New York (PSC-CUNY) Research Grant, 67736-00 45, July 2014 - June 2015.
4. PI, Association for Women in Mathematics - AWM - NSF travel grant, 2013-2014.
5. PI, Association for Women in Mathematics - AWM - NSF travel grant, 2011-2012.
6. Co-PI, CUNY Community College Collaborative Incentive Research Grant, 2013-2014.
7. PI, PSC-CUNY Research Grant, 65508-00 43, July 2012 - June 2013.
8. William Stewart Award, City University of New York, 2011.
9. Co-PI, Saint Louis University Summer Collaboration Research Award, 2009.
10. Visiting Grant, the Math Dept. of Texas A&M University, Jul. - Aug. 2008,
11. Women for Math Science Grant from the Technical University of Munich, January 2008.
12. Ph.D full scholarship from the German government, DAAD, 2002 - 2006.
13. Ph.D full scholarship from the German government, DAAD, 2001 - 2002, \$80,000
14. German Academic Exchange Program Scholarship, DAAD, Sept. 2001 - April 2002, \$20,000
15. Honored as the best master student in the University of Tehran, Iran, 2000
16. Honored as the best bachelor student in the University of Tabriz, Iran, 1998

Books

1. I am writing a book for advanced undergraduate and beginning graduate students on exponential bases in collaboration with Alex Iosevich and Steven Senger. The tentative title of the book is "*Fourier bases: an elementary viewpoint on a variety of applications*".
2. I am co-editing an AMS Contemporary Mathematics Volume, entitled *Harmonic Analysis and its Applications*, with Jens Christensen, Susanna Dann and Gestur Olafsson.
3. I have co-edited an AMS Contemporary Mathematics Volume, entitled *Commutative and Noncommutative Harmonic Analysis and Applications*, Vol. 603, 2013, with Alex Iosevich, Palle T. Jorgensen, and Gestur Olafsson. Vol. 603, 2013.
4. *Continuous and Discrete Wavelet Transformations on the Heisenberg Group*, Technische Universität München Press (online), Germany 2006.

Book chapter

Daryl Geller, Azita Mayeli, *Wavelets on Manifolds and Statistical Applications to Cosmology*; Wavelets and Multiscale Analysis, Theory and Applications, Birkhäuser, 2011.

Presentations (Selected - All presentations are invited talks)

1. (upcoming) *Riesz basis spectrals and Paley-Wiener spaces*, AMS Sectional Meeting, Washington D.C., March 8, 2015.
2. *Semidirect product groups and Haar integrals*, at the Graduate Center, Feb. 6, 2015.
3. *A correspondence between Paley-Wiener spaces and exponential bases*, 2015 JMM (Joint Mathematical Meetings), AMS Special Session on “Frames and Their Applications”, *San Antoine*, Jan. 10-13, 2015.
4. *Connection between exponential bases and translation bases*, Bronx College, CUNY, 12/2/14.
5. *Frames of translates on the Heisenberg group*, 5th International Conference on Computational Harmonic Analysis, May 19–23, 2014, Vanderbilt University
6. *An introduction to finite frame theory and its application in signal transmission*, The Graduate Center, City University of New York, Feb. 7, 2014
7. *LP decomposition of abstract Besov norms*, Yale University, Jan. 23, 2014
8. *Littlewood-Paley decomposition of Besov spaces and applications*, Washington University, St. Louis, Missouri, American Mathematical Society Meeting, Oct. 18, 2013.
9. *Characterization of cyclic Heisenberg subspaces*, St. Louis University, Missouri, Colloquium talk, Sept. 04, 2013.
10. *The Rotation Groups and its Representations; Mathematical Physics Seminar*, April 15, 2013.
11. *Bracket map for the Heisenberg group and the characterization of cyclic subspaces*, University of Colorado Boulder, American Mathematical Society Meeting, Boulder Colorado, April 14, 2013.
12. *Structure of Shift-Invariant Subspaces and their Bases for the Heisenberg Group*, Texas A&M University, College Station, Analysis and Probability Workshop, July 16 - 22, 2012.
13. *Wavelet frames and some of their applications in practice*, Colloquium talk at Queens College, CUNY, April 19, 2012
14. *Structure of Shift-invariant subspaces on the Heisenberg group*, Spring Eastern American Mathematical Society Meeting, George Washington University, Washington DC, March 18, 2012.
15. *An introduction to frames and wavelet frames: An introductory lecture*, City College, CUNY, colloquium talk, February 6, 2012. (Received honorarium)
16. *Structure of shift-invariant subspaces for the Heisenberg group*, JMM, Special Session on Classical and Abstract Harmonic Analysis: Topological and Lie Groups, Boston, Massachusetts, January 7, 2012.

17. *Besov spaces on Carnot spaces: Yet another example of coorbit spaces*, Vanderbilt University, Nashville, Tennessee, May 17, 2011.
18. *Wavelets: A tool for studying Banach function spaces*, Colloquium, Purdue University, colloquium talk, Jan. 27, 2011.
19. *Homogeneous Besov spaces on the stratified Lie groups as generalized coorbit spaces*, The American Joint Mathematical Society Meeting, New Orleans, Jan. 7, 2011.
20. Inhomogeneous Besov spaces for abstract Hilbert spaces, at a satellite workshop of American Mathematical Society Meeting in Baton Rouge, State University of Louisiana, 2011, Jan. 5, 2011.
21. *Multiresolution Shannon-type wavelet on the Heisenberg group*, American Mathematical Society Joint Meeting, San Francisco, Jan. 16, 2010.
22. *Construction of a Shannon-type wavelet on the Heisenberg group*, Workshop on Optimal Frames and Operator Algebras, San Francisco State University Jan 17-18, 2010,
23. *Spin wavelets on the sphere and their characterization into frames*, Illinois/ Missouri Applied Harmonic Analysis Seminar, St. Louis University, Missouri, Nov. 14, 2009.
24. Heisenberg wavelet sets and their characterization, Texas A&M University, colloquium talk, July 29, 2009.
25. Wavelet frame characterization of Besov spaces on stratified Lie groups, Colloquium, St. Louis University, Missouri, May 28, 2009.
26. *Shannon-type wavelet on the Heisenberg group*, Colloquium, Washington University in St. Louis Missouri, May 26, 2009.
27. *Wavelet frames on stratified Lie groups and their applications*, Colloquium. The University of Oregon, Oregon, colloquium talk, March 31, 2009.
28. *Mexican hat needlets and the uncorrelated coefficients*, Colloquium, University of Rome Tor Vergata, Italy, March 17, 2008.
29. *Spectral theory approach to wavelet theory on Lie groups*, Colloquium, Texas A&M University, July 23, 2008. Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, July, 2008
30. Mexican hat needlets and the uncorrelated coefficients, University of Rome Tor Vergata, Italy, Mar.17, 2008
31. *Introduction to Wavelets on the Sphere*, University of Waterloo, colloquium talk, Feb 15, 2008.
32. *Well-localized wavelets on compact manifolds*, International Conference - Strobl07 "Trends in Harmonic Analysis" June 18-22, 2007, Strobl, Austria.
33. *Besov Spaces and frames on stratified Lie groups*, Inzell, Germany, Sep.17-21, 2007.
34. (Poster presentation) *Nearly tight wavelet frames for stratified Lie groups*, Strobl, Austria, Jun.18-22, 2007.
35. (with honorarium) *An introduction to the Schwartz frames on the stratified Lie groups*, Rafsanjan, Iran, Mar.7-9, 2007.

36. *Approximation through the Schwartz wavelets with arbitrary many vanishing moments*, University of Erlangen, 47th Workshop in Approximation Theory, Nuernberg, Germany, Feb.02, 2007.
37. *Discrete and continuous mexican hat wavelet on the Heisenberg group*, ICM, Madrid, Aug.23-30, 2006.
38. *Constructing and implementing wavelets on the torus*, HASSIP Workshop 06, GSF-IBB, Neuherberg Munich, Germany, Sep.11-14, 2006.
39. (poster presentation) *Mexican hat wavelet on the Heisenberg group*, Workshop on Wavelets and Applications Semester, EPFL, Lausanne, Switzerland, Jul.10-14, 2006.
40. *Some continuous and discrete wavelet theory for the Heisenberg group and other stratified Lie groups*, Workshop on Recent Progress in Wavelet Analysis and Frame Theory, Bremen, Germany, Jan.23-26, 2006.
41. *Some wavelet theory for stratified Lie groups through the solution of heat equation*, International Conference in Harmonic Analysis and Partial Differential Equations, Kiel, Germany, Jun 2005.
42. (with honorarium) *An introduction to continuous and discrete wavelets on the Heisenberg group*, Stony Brook University, New York, Feb.22, 2005.
43. *Shannon multiresolution analysis on the Heisenberg group*, TUM, Technische Universitaet Muenche, Germany, Jun 2003.

Conferences Organized (in the last five years)

1. With Alex Iosevich (of Rochester University) and Gestur Olafsson (LSU) I am organizing an *International Conference on Harmonic Analysis and Applications*, funded by the NSF grant DMS-1501066, at the Graduate Center of CUNY, New York, June 1-5, 2015.
2. With Susanna Dann and Gestur Olafsson I have organized a special session in the Spring Eastern AMS Sectional Meeting in the University of Maryland, Baltimore County, March 29-30, 2014.
3. Since 2011, I have been running a series of weekly seminars and study groups at the Graduate Center of CUNY on the topics of *Mathematical Physics, Fourier Transform, and Applications*, for the advanced undergraduate and graduate students.
4. With Alex Iosevich, I have co-organized a special session in the Fall Eastern AMS Sectional Meeting in Rochester Institute of Technology, Rochester, NY, September 22-23, 2012.

Graduate Seminars Organized

Since 2011, I have been running a series of weekly seminars and study groups at the Graduate Center of CUNY on the topics of *Mathematical Physics, Fourier Transform, and Applications*, for the advanced undergraduate and graduate students.

Mayeli's collaborators in the past 48 months

Davide Barberi (Universidad Autónoma de Madrid), Jens Christensen (Colgate University), Bradley Currey (St. Louis University), Susanna Dann (Vienna University of Technology), Alex Iosevich (Rochester University), Palle Jorgenson (University of Iowa), Hartmut Führ (RWTH Aachen University, Germany), Daryl Geller (Stony Brook Uni.- SUNY-deceased 2011), Frode Kristian Hansen (University of Oslo), Eeugenio Hernández (Universidad Autónoma de Madrid), Dominico Marinucci (University of Rome "Tor Vergata"), Gestur Ólafsson (Louisiana State University), Vignon Oussa (Bridgewater University), Øystein Rudjord (University of Oslo), Steven Senger (Missouri State University), Sandro Scodeller (University of Oslo)