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Kathy Donovan Merrill

Professor *Emerita* of Mathematics
The Colorado College
Colorado Springs, Colorado 80903

EDUCATION:

Ph.D.,	Mathematics (1983) University of Colorado, Boulder
M.A.,	Mathematics (1977) University of New Mexico
B.A.,	Mathematics (1975) The Colorado College

EXPERIENCE:

October, 2006	Visiting Professor of Mathematics Colorado College
Spring 2005	Ulam Professor of Mathematics University of Colorado, Boulder
1985 -- 2003	Colorado College Mathematics Department Assistant Professor 1985-1990 Associate Professor 1991-1998 Professor 1999-2003 Department Chair 2000-2003
1983 – 1985	Acting Assistant Professor of Mathematics University of Washington, Seattle

PUBLICATIONS:

"Smooth well-localized Parseval wavelets based on wavelet sets in R^2," to appear in **Contemp. Math.**.

"Simple wavelet sets for scalar dilations in R^2," to appear in **Representations, Wavelets and Frames: A Celebration of the Mathematical Work of Lawrence Baggett**, P. Jorgensen, K. Merrill and J. Packer, eds., Birkhauser, Boston.

"Fractal wavelets of Dutkay-Jorgensen type for the Sierpinski gasket space," (with J. D'Andrea and J. Packer), to appear in **Contemp. Math.**.

"A non-MRA C^r frame wavelet with rapid decay," (with L. Baggett, P. Jorgensen, and J. Packer), **Acta Appl. Math.** 89 (2006), 251-270.

"Construction of Parseval wavelets from redundant filter systems," (with L. Baggett, P. Jorgensen, and J. Packer), **J. Math. Phys.** 46 (August 2005).

"Constructing wavelet from generalized filters," *European Women in Mathematics—Marseille 2003*, **CWI Tract** 135 (2005), 1-10.

PUBLICATIONS (cont'd):

"An analogue of the Bratteli-Jorgensen loop group action for GMRA's," (with L. Baggett, P. Jorgensen and J. Packer), **Contemp. Math.** 345 (2004), 11-25.

"The construction of wavelets from generalized conjugate mirror filters in $L^2(R^n)$," (with L. Baggett and J. Courter), **Appl. Comput. Harmon. Anal.** 13 (2002), 201-223.

"Abstract harmonic analysis and wavelets in R^n," (with L. Baggett), **Contemp. Math.** 247 (1999), 17-27.

"Automorphic forms and sums of squares over function fields," (with J. Hoffstein and L. Walling), **Journal of Number Theory** 79 (1999), 301-329.

"Generalized multiresolution analyses, and a construction method for all wavelet sets in R^n," (with L. Baggett and H. Medina), **J. Fourier Anal. Appl.** 5 (1999), 563-573.

"Cohomology of polynomials under an irrational rotation," (with L. Baggett and H. Medina), **Proc. Amer. Math. Soc.** 126 (1998), 2909-2918.

"Simultaneously symmetric functions," (with L. Baggett and H. Medina), **Amer. Math. Monthly** 104 (1997), 520-528.

Book Review of *Julia: A Life in Mathematics* by Constance Reid, **National Women's Studies Association Journal** 9 (1997), 205-206.

"On quadratic reciprocity over function fields," (with L. Walling), **Pacific Journal** 173 (1996), 147-150.

"On functions that are trivial cocycles for a set of irrationals II," (with L. Baggett and H. Medina), **Proc. Amer. Math. Soc.**, 124 (1996), 89-93.

"Continued fractions and series," (with L. Clemens & D. Roeder), **Journal of Number Theory** 54 (1995), 309-317.

"Sums of squares over function fields," (with L. Walling), **Duke Journal of Mathematics** 71 (1993), 665-684.

"Smooth cocycles for an irrational rotation," (with L. Baggett), **Israel Journal of Mathematics** 79 (1992), 281-288.

"On the cohomological equivalence of a class of functions under an irrational rotation of bounded type," (with L. Baggett), **Proc. Amer. Math. Soc.** 111 (1991), 787-793.

"Equivalence of cocycles under an irrational rotation," (with L. Baggett), **Proc. Amer. Math. Soc.** 104 (1988), 1050-1053.

"Cocycles on the Circle, II," (with H. Helson), **Operator Theory: Advances and Applications, Vol. 28**, Birkhauser Verlag Basel, 1988, 121-124.

"Representation of the Mautner group and cocycles of an irrational rotation," (with L. Baggett), **Michigan Mathematics Journal** 33 (1986), 221-229.

"Cohomology of step functions under an irrational rotation," **Israel Journal of Mathematics** 52 (1985), 320-340.

SELECTED PRESENTATIONS:

"Wavelet sets that are finite unions of convex sets," invited talk, special session, national meeting of the Amer. Math. Soc., San Diego, CA, January 2008.

"Smooth non-MRA wavelets built from generalized filters, plenary address, Great Plains Operator Symposium, Iowa City, Iowa, May 2006.

"Penrose Tiles," Colloquium, Colorado College, December 2005.

"A non-MRA C^r frame wavelet with rapid decay," invited talk, special session, regional meeting of the Amer. Math. Soc., Albuquerque, New Mexico, October 2004.

"The Ubiquitous Sierpinski's Gasket," Colloquium, Fort Lewis College, February 2004.

"Constructing wavelets from generalized conjugate mirror filters," invited address, *11ème colloque international de l'EWM*, Marseille, France, November 2003.

"Generalized conjugate mirror filters," invited talk, National University of Singapore, March 2001.

"Wavelets and abstract harmonic analysis," Colloquium, Dartmouth College, April 1999.

"Introduction to continued fractions: different perspectives," "Continued fractions and series," and "Open problems involving continued fractions," *Conference to Celebrate Women Mathematicians in Number Theory and Analysis*, University of California, Berkeley (August 1997).

"Mathematics and absolute truth," Feminists and Feminism in the Sciences, Women's Resource Center, University of Colorado, Boulder, broadcast on KGNU radio (November 1996).

"The set of irrationals for which a cocycle is trivial," Ergodic Theory Conference, Prague, Czech Republic (March 1995).

PROFESSIONAL SERVICE:

Referee for **Applied and Computational Harmonic Analysis**, **Journal of Fourier Analysis and Applications**, **Journal of Functional Analysis, Proceedings of the AMS, American Mathematical Monthly, Mathematics Magazine, National Women's Studies Association Journal, Commentationes Math. Univ. Carolinae**

Reviewer for **Mathematical Reviews**

Co-organizer of two special sessions at AMS meetings and one NSF sponsored conference

Project **NEXT** consultant

Outside reviewer for the Fort Lewis College Mathematics Department

Dissertation Committee member for six Ph.D. students at the University of Colorado, Boulder

Mathematical outreach presentations in public schools and senior citizen centers