

R é s u m é

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:

2006 --2016 Visiting Professor of Mathematics (occasional courses)
The Colorado College

Spring 2005 Ulam Professor of Mathematics
University of Colorado, Boulder

1985 -- 2003 The Colorado College Mathematics Department
Department Chair 2000-2003
Professor 1999-2003
Associate Professor 1991-1998
Assistant Professor 1985-1990

1983 – 1985 Acting Assistant Professor of Mathematics
University of Washington, Seattle

PUBLICATIONS:

- “Decomposing the wavelet representation for shifts by wallpaper groups,” (with L. Baggett, J. Packer and K. Taylor), submitted for publication.
- “Wavelet sets for crystallographic groups,” to appear in **J.J.Benedetto Jubilee**, Birkhauser (2020).
- Generalized Multiresolution Analyses**, Birkhauser Basel (2018).
- “Simple wavelet sets in \mathbb{R}^n ,” **J. Geom. Anal.** 25 (2015), 1295-1305.
- “Simple wavelet sets for matrix dilations in \mathbb{R}^2 ,” **Num. Funct. Anal. Opt.** 33 (2012), 1112-1125.
- “Probability measures on solenoids corresponding to fractal wavelets,” (with L. Baggett, J. Packer and A. Ramsay, **Trans. Amer. Math. Soc.** 364 (2012), 2723-2748.
- “Classification of generalized multiresolution analyses,” (with L. Baggett, V. Furst and J. Packer), **J. Funct. Anal.** 258 (2010), 4210-4228.
- “Generalized filters, the low-pass condition, and connections to multiresolution analyses,” (with L. Baggett, V. Furst and J. Packer), **J. Funct. Anal.** 257 (2009), 2760-2779.
- “Generalized multiresolution analyses with given multiplicity functions,” (with L. Baggett, N. Larsen, J. Packer and I. Raeburn), **J. Fourier Anal. App.** 15 (2009), 616-633.
- “Smooth well-localized Parseval wavelets based on wavelet sets in \mathbb{R}^2 ,” **Contemp. Math.** 464 (2008), 161-175.

PUBLICATIONS (cont'd):

- “Simple wavelet sets for scalar dilations in \mathbb{R}^2 ,” **Representations, Wavelets and Frames: A Celebration of the Mathematical Work of Lawrence Baggett**, P. Jorgensen, K. Merrill and J. Packer, eds., Birkhauser, Boston (2008), 177-192.
- Representations, Wavelets and Frames: A Celebration of the Mathematical Work of Lawrence Baggett**, (co-edited with P. Jorgensen and J. Packer), Birkhauser, Boston (2008).
- “Fractal wavelets of Dutkay-Jorgensen type for the Sierpinski gasket space,” (with J. D’Andrea and J. Packer), **Contemp. Math.** 451 (2008), 69-88.
- “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.
- “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 $L^2(\mathbb{R}^n)$,” (with L. Baggett and J. Courter), **Appl. Comput. Harmon. Anal.** 13 (2002), 201-223.
- “Abstract harmonic analysis and wavelets in \mathbb{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 \mathbb{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.

PUBLICATIONS (cont'd):

- “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:

- “Crystallographic wavelet sets”, invited talk, Analysis Seminar, University of Colorado, Boulder, CO, May 2018.
- “Smooth, well-localized Parseval wavelets based on simple wavelet sets in \mathbb{R}^n ,” invited address, February Fourier Conference, College Park, MD, February 2016.
- “Simple wavelet sets in \mathbb{R}^n ,” invited talk, special session, regional meeting of the Amer. Math. Soc., Washington D.C., March 2012.
- “Sunrise, sunset: the analemma and the solar day,” Colloquium, Fort Lewis College, November, 2011.
- “Equivalence parameters and a canonical construction for GMRAs,” plenary address, Great Plains Operator Symposium, Boulder, CO, June 2009.
- “Dilations of \mathbb{R}^2 that have simple wavelet sets,” invited talk, special session, regional meeting of the Amer. Math. Soc., Baton Rouge, LA, March 2008.
- “Penrose Tiles,” Fearless Friday Seminar, Colorado College, December 2005.
- “Constructing wavelets from generalized conjugate mirror filters,” invited address, *11ème colloque international de l'EWM*, Marseille, France, November 2003.

PROFESSIONAL AND COMMUNITY SERVICE:

Referee for numerous mathematical journals.

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

Tutor for local high school and college mathematics students

Treasurer, Mancos Public Library Board, 2010-2015

Volunteer, Mesa Verde National Park