

ERIN P. J. PEARSE

Research Interests

Fractal Geometry, Analysis, and Dynamical Systems; especially connections to Geometric Measure Theory, Partial Differential Equations, and Number Theory.

Employment

Visiting Assistant Professor Current Position
Cornell University

Education

Ph.D. in Mathematics, University of California, Riverside June 2006
Michel L. Lapidus, Advisor

Thesis: Complex Dimensions of Self-Similar Systems.

M.S in Mathematics, University of California, Riverside June 2001
UCR Chancellor's Distinguished Fellow. (2 years)

B.S. in Mathematics, University of California, Riverside June 1998
Upper and lower division honours.

Senior Thesis: Universality of the Sierpinski Carpet.

B.S. in Philosophy, University of California, Riverside June 1997
Upper and lower division honours.

Publications

A tube formula for the Koch snowflake curve, with applications to complex dimensions (with M. L. Lapidus), J. London Math. Soc., accepted Sept. 2005. 18 pages. arXiv: math-ph/0412029.

Canonical self-similar tilings by IFS, submitted to Indiana Univ. Math. J., July 2006. 16 pages. arXiv: math.MG/0606111.

Tube formulas and complex dimensions of self-similar tilings (with M. L. Lapidus), submitted to Memoirs Amer. Math. Soc., July 2006. 61 pages. arXiv: math.DS/0605527.

Curvature measures and tube formulas for compact sets (with M. L. Lapidus), in prep.

Complex Dimensions of Self-Similar Systems. Ph.D. Dissertation, June 2006.

Presentations

Notes or slides for each presentation are available in PDF at <http://www.math.cornell.edu/~erin/>.

- *Fractal strings and complex dimensions*.
Cornell University Analysis Seminar, Sept. 4, 2006.

- *Self-similar tilings and their complex dimensions.*
21st Summer Conference on Topology and its Applications. Georgia Southern University, July 6, 2006.
- *Tube formulas and complex dimensions of self-similar tilings.*
AMS Western Sectional Meeting, Special Sessions on Fractal Geometry: Connections to Dynamics, Geometric Measure Theory, Mathematical Physics and Number Theory. San Francisco State University, April 2006.
- *Curvature measures, convexity, and integral geometry: an introduction to mixed volumes and the Steiner formula.* (3 talks)
UC Riverside, Mathematical Physics and Dynamical Systems Seminar, Fall 2005.
- *Complex dimensions of fractal subsets of \mathbf{R}^d .* 2nd Annual Conference on Analysis and Probability on Fractals. Cornell, June 2005.
- *A tube formula for the Koch snowflake curve.*
AMS Western Sectional Meeting, Special Sessions on Spectral Analysis (UNM, Albuquerque, NM) Oct. 2004.

AMS Central Sectional Meeting, Special Sessions on Fractals and Dynamical Systems (Northwestern, Evanston, IL) Oct. 2004.
- *Distributions and the Descent Method.* (3 talks)
UC Riverside, Mathematical Physics and Dynamical Systems Seminar, Jan. 2005.
- *An introduction to fractal geometry, dimension, and nonsmooth analysis.*
UC Riverside, Graduate Student Seminar, Jan. 2005.
- *An Introduction to LaTeX.*
UC Riverside, Graduate Student Seminar, Oct. 2004.
- *Iteration of rational functions.*
UC Riverside, Mathematical Physics and Dynamical Systems Seminar, Nov. 2003.
- *The n -dimensional Laplacian.*
UC Riverside, Mathematical Physics and Dynamical Systems Seminar, June 2003.
- *Characterizing the measurability of fractal strings.*
Ph. D. Oral Examination, UC Riverside, May 2003.
UC Riverside, Mathematical Physics and Dynamical Systems Seminar, Apr. 2003.
- *The Feigenbaum number.*
UC Riverside, Mathematical Physics and Dynamical Systems Seminar, Apr. 2003.
- *A primer on dimension theory.*
UC Riverside, Mathematical Physics and Dynamical Systems Seminar, Jan. 2003.

Conferences Attended

*Indicates that a talk was given at the meeting.

21st Summer Conference on Topology and its Applications. Statesboro, GA. July 2006.*

AMS Western Sectional Meeting. San Francisco, CA. Apr. 2006.*

AMS National Meeting. San Antonio, TX. Jan. 2006.*

2nd Annual Conference on Analysis and Probability on Fractals. Ithaca, NY. June 2005.*

AMS Central Sectional Meeting. Evanston, IL. Oct. 2004.*

AMS Western Sectional Meeting. Albuquerque, NM. Oct. 2004.*

AMS National Meeting. Phoenix. Jan. 2004.

AMS National Meeting. San Diego. Jan. 2002.

MSRI Summer Program: Mathematical Biology. UC Berkeley. June 2000.

Awards and Honours

UCR Mathematics Teaching Assistant of the Year, 2004-2005.

UC Riverside Chancellor's Distinguished Fellowship, 1999-2001.

Phi Beta Kappa National Honours Society, 1998.

Golden Key National Honours Society, 1998.

Dean's List, UC Riverside, 1993-1998.

Undergraduate Honours Fellowship, 1993-1994.

National Merit Scholar (99th percentile), 1993.

Teaching Experience

Lecture notes and other course materials are available in PDF at <http://www.math.cornell.edu/~erin/>.

Doctoral-level material: Real Analysis Ph.D. Exam Seminar (2006), Topology Ph.D. Exam Seminar (2005), Real Analysis Ph.D. Exam Seminar (2004), Real Analysis Ph.D. Exam Seminar (2003).

Primary instructor (undergraduate): Honors Analysis II, Introduction to Analysis, Differential Equations, Linear Algebra (twice), Single-Variable Calculus (twice).

Teaching assistant (undergraduate): Single-variable Calculus, Multivariable Calculus, Differential Equations, Discrete & Finite Mathematics, Game Theory, Optimization, Set Theory, Topology, Algebraic Topology, Probability & Statistics, Analysis/Advanced Calculus, Complex Variables.

Student evaluations: consistently excellent rating in all areas. Verbal comments agree on the following: instructor is very challenging, but organized, entertaining, and clear. Evaluations are on file, available on request.

Memberships

Member: American Mathematical Society (AMS), 1999-present.

President: UCR Mathematics Club, 1997.

Co-founder: UCR Mathematics Club, 1996.

Support

Funding from NSF to attend the 21st Summer Conference on Topology and its Applications, July 2006.

Funding from Cornell University to attend the 2nd Annual Conference on Analysis and Probability on Fractals, June 2005.

Funding from UC Riverside to attend all AMS meetings.

Funding from MSRI (Berkeley) to attend the Summer 2000 Program.

Related Skills

Some fluency in French (sufficient for translation/research and basic conversation). Reasonable fluency in TeX, Mathematica, HTML, Javascript, Flash.

2+ years industry experience: internet marketing and multimedia design.

Other Activities

Co-organizer, Special Session on Fractals, AMS Western Meeting, Apr. 29-30, 2006.

Initiated an overhaul of the UCR Math Department web page; structural and graphical redesign and a prototype. (<http://math.ucr.edu/~erin/demo>)

Helped initiate the Summer Preparatory Seminar Program, 2003; a review and practice session run by the advanced graduate students with the aim of helping other graduate students prepare for the doctoral qualification exams.

Co-founded the Teaching Assistant Mentor program at UCR, 2003.
Teaching Assistant Mentor, 2003-2006.

Founded the UCR Math Department T-shirt program, 2003.

References

Dr. Michel L. Lapidus, UC Riverside (Advisor).

Dr. Neil E. Gretsky, UC Riverside (for teaching).

Dr. Robert S. Strichartz, Cornell University.

Dr. Alexander Teplyaev, University of Connecticut.

Dr. Machiel van Frankenhuysen, Utah Valley State College.

Dr. Fred Wilhelm, UC Riverside (for teaching).

Dr. Qi S. Zhang, UC Riverside.