



# Paul A. Fili

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## Professional experience

- 8/2014 – present ASSISTANT PROFESSOR OF MATHEMATICS  
**Oklahoma State University**, Department of Mathematics, Stillwater, OK.
- 8/2013 – 7/2014 VISITING ASSISTANT PROFESSOR OF MATHEMATICS  
**Oklahoma State University**, Department of Mathematics, Stillwater, OK.
- 7/2010 – 6/2013 VISITING ASSISTANT PROFESSOR OF MATHEMATICS  
**University of Rochester**, Department of Mathematics, Rochester, NY.

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## Education

- 8/2004 – 5/2010 PH.D. IN MATHEMATICS  
**University of Texas at Austin**, Department of Mathematics, Austin, TX.  
Ph.D. Dissertation *Orthogonal Decompositions of the Space of Algebraic Numbers Modulo Torsion*  
Advisor Prof. Jeffrey D. Vaaler
- 9/2000 – 6/2004 A.B. MATHEMATICS AND PHYSICS, LANGUAGE CITATION CLASSICAL GREEK  
**Harvard University**, Cambridge, MA.  
Honors Thesis *On the Elliptic Curve Method of Factorization*  
Advisor Dr. Frank Calegari

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## Publications

1. *On the non-Archimedean metric Mahler measure* (with C.L. Samuels). J. Number Theory 129 (2009), no. 7, 1698–1708. [dx.doi.org/10.1016/j.jnt.2008.12.009](https://doi.org/10.1016/j.jnt.2008.12.009)
2. *Orthogonal decomposition of the space of algebraic numbers and Lehmer’s problem* (with Z. Miner). J. Number Theory 133 (2013), no. 11, 3941–3981. [dx.doi.org/10.1016/j.jnt.2013.05.004](https://doi.org/10.1016/j.jnt.2013.05.004)
3. *Norms extremal with respect to the Mahler measure* (with Z. Miner). J. Number Theory 132 (2012), no. 1, 275–300. [dx.doi.org/10.1016/j.jnt.2011.07.006](https://doi.org/10.1016/j.jnt.2011.07.006)
4. *A generalization of Dirichlet’s  $S$ -unit theorem* (with Z. Miner). Acta Arith. 162 (2014), no. 4, 355–368.
5. *On the heights of totally  $p$ -adic numbers*. J. Théor. Nombres Bordeaux 26 (2014), no. 1, 103–109.
6. *Energy integrals over local fields* (with C. Petsche). Int. Math. Res. Not., 2015(5):1278–1294, 2015. [dx.doi.org/10.1016/10.1093/imrn/rnt250](https://doi.org/10.1016/10.1093/imrn/rnt250)
7. *Equidistribution and the heights of totally real and totally  $p$ -adic numbers* (with Z. Miner). Acta Arith. 170 (2015), no. 1, 15–25.
8. *Height bounds for algebraic numbers satisfying splitting conditions* (with I. Pritsker). J. Number Theory, in press.

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## Preprints

9. *Energy integrals and small points for the Arakelov height* (with C. Petsche and I. Pritsker). Preprint available at arXiv:1507.01900.
10. *Quantitative height bounds under splitting conditions* (with L. Pottmeyer). Preprint available at arXiv:1508.01498.

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## Graduate Advising

- Spring 2016 *Dynamical Systems and Heights*, Master's thesis, H. Bodiford.  
Spring 2015 *The Birch and Swinnerton-Dyer Conjecture*, Master's thesis, S. Hader.  
Spring 2015 *Mahler measure as a dynamical system*, Master's thesis, M. Zhang.  
Spring 2015 *Computing the relative energies of musical intervals*, Master's thesis, A. Means.

### CURRENT STUDENTS:

Y. Kong (Doctoral), M. Zhang (Doctoral), C. James (Master's)

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## Selected Talks

- Mar. 2017 *Unlikely intersections in arithmetic dynamics*, invited talk to be given at a conference in honor of Robert Rumely, University of Georgia.
- July 2016 Participated in six-person week-long Collaborate@ICERM workshop on Arithmetic Dynamics and Sage, included informal presentations amongst the team.
- Oct. 2015 *Effective bounds for unlikely intersections in arithmetic dynamics*, The Geometry, Algebra, and Analysis of Algebraic Numbers, Banff International Research Station.
- May 2015 *Energy integrals and heights of algebraic numbers*, Number Theory Seminar, Oregon State University.
- May 2015 *Discrete approximations to energy integrals and heights*, Number Theory Seminar, University of Oregon.
- Oct. 2014 *The primes and topology*, Topology Seminar, Penn State Altoona.
- May 2014 *Some energy integrals with external fields related to heights*, Constructive Functions 2014 (in honor of Ed Saff), Vanderbilt University.
- Mar. 2014 *Energies and height of algebraic numbers*, Number theory seminar, University of Georgia.
- Dec. 2013 *Energy integrals and height bounds* (invited talk), Heights in Diophantine geometry, group theory and additive combinatorics workshop, Erwin Schödinger International Institute for Mathematical Physics, Vienna, Austria.

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## Research Interests

Heights of algebraic numbers, arithmetic potential theory, arithmetic dynamics, unlikely intersections, Mahler measure, and Lehmer's problem.

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## Professional

Member, American Mathematical Society, 2004 – Present

Referee for Bulletin of the London Mathematical Society, Int. Journal of Number Theory, Experimental Math., Research in Number Theory, Security and Communication Networks, et al.