

Murat Akman

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Employment

- July 2019 **University of Essex, Colchester, UK**
Lecturer (Assistant Professor) in Mathematics
- Aug 2016–July 2019 **University of Connecticut, Storrs, CT**
Evarist Giné Assistant Research Professor (non-Tenure Track), Mentor: Matthew Badger
- Nov 2014–Aug 2016 **Consejo Superior de Investigaciones Científicas, Madrid, Spain**
Postdoctoral Fellow at *Instituto de Ciencias Matemáticas (ICMAT)*, Mentor: José María Martell

Fellowships

- Jan 2017–May 2017 **Mathematical Sciences Research Institute (MSRI), Berkeley, California**
Postdoctoral Fellow in the *Harmonic Analysis* program, Mentor: Tatiana Toro
- Sept 2013–Dec 2013 **Institut Mittag-Leffler, Stockholm, Sweden**
Postdoctoral Fellow in the *Evolutionary Problems* semester

Education

- May 2014 **Ph.D., Mathematics, University of Kentucky**, Adviser: John Lewis
- May 2012 **M.S., Mathematics, University of Kentucky**
- June 2009 **M.S., Mathematics, Middle East Technical University**, Ankara, Turkey
- June 2006 **B.S., Mathematics, Middle East Technical University**, Ankara, Turkey

Research Interests

Analysis, PDEs, Potential Theory, Geometric Measure Theory

Publications

Submitted

17. **Failure of Fatou type theorems for solutions to PDE of p -Laplace type in domains with flat boundaries**, with *John Lewis and Andrew Vogel*
(2021), arXiv:2109.04952, 47 pages.
16. **Square function and non-tangential maximal function estimates for elliptic operators in 1-sided NTA domains satisfying the CDC**, with *Steve Hofmann, José María Martell, and Tatiana Toro*
(2019), arXiv: 2103.10046, 35 pages.
15. **Perturbation of elliptic operators on 1-Sided NTA domains satisfying the CDC**, with *Steve Hofmann, José María Martell, and Tatiana Toro*
(2019), arXiv: 1901.08261, 55 pages.

Published or To appear

14. **On a Bernoulli-type overdetermined free boundary problem**, with *Agnid Banerjee and Mariana Smit Vega Garcia*
(2019), To appear in *Ann. Fenn. Math.*, arXiv: 1911.02801, 17 pages
13. **On a Theorem of Wolff Revisited**, with *John Lewis and Andrew Vogel*
(2020), To appear in *Journal d'Analyse Mathématique*, arXiv:2002.04677, 40 pages
12. **Note on an eigenvalue problem with applications to a Minkowski type regularity problem in \mathbb{R}^n** , with *John Lewis and Andrew Vogel*
Calc. Var. Partial Differential Equations **59** (2020), no:2, Paper no 47.

11. **The Brunn-Minkowski inequality and A Minkowski problem for \mathcal{A} -harmonic Green's function**, with *John Lewis, Olli Saari, and Andrew Vogel*
To appear in *Advances in Calculus of Variations*, arXiv:1810.03752, 76 pages.
10. **Note on an Eigenvalue problem for an ODE originating from a homogeneous p -harmonic function**, with *John Lewis and Andrew Vogel*
This is a survey article dedicated to V. G. Maz'ya on the occasion of his 80th birthday. *Algebra i Analiz* **31** (2019), no:2, 75-87
9. **Absolute continuity of harmonic measure for domains with lower regular boundaries**, with *Jonas Azzam and Mihalis Mourgoglou*
Advances in Mathematics **345** (2019), 1206-1252.
8. **The Brunn-Minkowski inequality and a Minkowski problem for nonlinear capacity**, with *Jasun Gong, Jay Hineman, John Lewis, Andrew Vogel*
To appear in *Memoirs of the AMS*, arXiv:1709.00447, 108 pages.
7. **Rectifiability, interior approximation and Harmonic Measure**, with *Simon Bortz, Steve Hofmann, and José María Martell*
To appear in *Arkiv för Matematik*, 2016, arXiv:1509.0706, 18 pages.
6. **σ -finiteness of elliptic measures for quasilinear elliptic PDE in space**, with *John Lewis and Andrew Vogel*
Advances in Mathematics, **309** (2017), 512–557.
5. **On the absolute continuity of p -harmonic measure and surface measure in Reifenberg flat domains**
Pacific Journal of Mathematics **286-1** (2017), 25–37.
4. **Rectifiability and elliptic measures on 1-sided NTA domains with Ahlfors-David regular boundaries**, with *Matthew Badger, Steve Hofmann, and José María Martell*
Trans. Amer. Math. Soc. **369** (2017), no. 8, 5711-5745
3. **Hausdorff dimension and σ -finiteness of p -harmonic measures in space when $p \geq n$** , with *John Lewis and Andrew Vogel*
Nonlinear Analysis: Theory, Methods & Applications, **129**:198–216, 2015.
2. **On the dimension of a certain measure in the plane**
Ann. Acad. Sci. Fenn. Math., **39**(2014), 187–209.
1. **On the logarithm of the minimizing integrand for certain variational problems in two dimensions**, with *John Lewis and Andrew Vogel*
Analysis and Mathematical Physics, Volume 2, Number 1(2012), 79–88.

Talks from 2014-current

Plenary Talks: LMS Harmonic Analysis and PDE Research Network, Northeastern Analysis Meeting (University of Albany), Nonsmooth Analysis: a Workshop for Postdocs(University of Connecticut), Workshop on HA, PDEs and GMT (ICMAT, Madrid).

Seminar Talks: At Bonn, Kent, Birmingham, Oxford, Brown, Minnesota, Temple University, University of Pennsylvania, University of Connecticut, University of Washington, MSRI (Berkeley),

Professional Activities

- Spring 2022 Co-organizer for 2-day meeting on Integrability and Analysis of PDEs (supported by the London Mathematical Society Scheme 9 Grant)
- Spring 2022 Co-organizer for a one-day conference on Mathematics of the Eastern Arc at University of Kent (supported by The Eastern Academic Research Consortium)
- Spring 2019 External examiner for Juan Cavero at Universidad Autónoma de Madrid
- Spring 2021 External examiner for Andrew J. Turner at University of Birmingham
- April 2019 Co-organizer for the special session on “Regularity Theory of PDEs” at the AMS sectional meeting at the University of Connecticut Hartford

- March 2019 Co-organizer for the graduate student conference on “Geometric and Harmonic Analysis” at University of Connecticut
- April 2018 Co-organizer for the special session on “Regularity of PDEs on Rough Domains” at the AMS sectional meeting at Northeastern University
- Fall 2017- Refereed Journal Articles for: *Memoirs of the AMS*, *Advances in Calculus of Variations*, *Transactions of the AMS*, *Proceedings of the AMS*, *Pure and Applied Analysis*, *Forum of Mathematics*, *Sigma*, *Israel Journal of Mathematics*, *International Mathematics Research Notices*, *Potential Analysis*, *Inventiones Mathematicae*.

Teaching

At University of Essex: Applied Mathematics (University Physics), Ordinary Differential Equations, Quantum Mechanics, Real Analysis II, Complex Variables and Applications.

At University of Connecticut: Ordinary Differential Equations, Real Analysis I, Partial Differential Equations, Differential Equations for Applications.

Current Administrative Duties at University of Essex

- Senior Exam Officer for all UG and PGT modules for all courses of the department.
- Capstone (Final Year) Project Co-Coordinator.
- Member of Department Education Committee.
- Member of Progress Panel of the department.
- Chair of Extenuating Circumstances and Late Submission committee of department.
- Deputy Lead of the Analysis and Mathematical Physics Research Theme.