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Murat Akman

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 $\sigma-$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 Variable 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.