IHSAN ATA TOPALOGLU

CONTACT INFORMATION

McMaster University
Department of Mathematics and Statistics
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CAREER GOAL

Tenure-track assistant professorship at a research university or a top-tier liberal arts college.

RESEARCH INTERESTS

Calculus of variations and partial differential equations with a focus on problems arising from materials science and models of biological aggregations. In particular, the analysis of variational problems which result in energy-driven pattern formations and the geometry of energy landscapes.

POSITIONS

1/2015–8/2016 **McMaster University**, Hamilton, ON, Canada
Fields–Ontario Postdoctoral Fellow
Faculty supervisors: Stanley Alama and Lia Bronsard

8/2014–1/2015 **The Fields Institute for Research in Mathematical Sciences**, Toronto, ON, Canada
Fields–Ontario Postdoctoral Fellow

8/2012–8/2014 **McGill University**, Montréal, QC, Canada
Postdoctoral Fellow
Partially sponsored by the *Applied Mathematics Laboratory* of the *Centre de Recherches Mathématiques*
Faculty Supervisors: Rustum Choksi and Gantumur Tsogtgerel

6/2011–12/2011 **Boğaziçi University**, Istanbul, Turkey
Visiting Summer Instructor

EDUCATION

6/2012 Ph.D. in Mathematics, **Indiana University**, Bloomington, IN

- Thesis Title: “An Isoperimetric Problem with Long-Range Interactions”
- Advisor: Peter J. Sternberg

6/2007 M.Sc. in Mathematics, **Boğaziçi University**, Istanbul, Turkey

- Thesis Title: “Variational methods for nonlinear elliptic partial differential equations with nonlocal terms”
- Advisor: Alp Eden

6/2005 B.Sc. in Mathematics with Honors Degree, **Boğaziçi University**, Istanbul, Turkey

Fellowships and Awards

Fields–Ontario Postdoctoral Fellowship, 2014–2016

William B. Wilcox Mathematics Award, 2012

Glen Schober Memorial Travel Award, 2012

David A. Rothrock Teaching Award, 2011

Glen Schober Memorial Travel Award, 2010

James P. Williams Memorial Honorary Mention, 2008

College of Arts and Sciences Graduate Student Travel Award, 2007

TÜBİTAK (The Scientific and Technological Research Council of Turkey) Graduate Scholarship, 2005–2007

Publications

In Preparation:

Droplet phases of a nonlocal isoperimetric problem with an attractive source term on S^2,
(with A. Contreras and C. Garcia-Azpeitia), *in preparation*.

Local/global minimality and stability of an energy related to nanoparticle-polymer blends,
(with S. Alama and L. Bronsard), *in preparation*.

In Press:

Nonlocal shape optimization via interactions of attractive and repulsive potentials,
(with A. Burchard and R. Choksi), *submitted*.

2016 *Sharp interface limit of an energy modelling nanoparticle-polymer blends,*
(with S. Alama and L. Bronsard), *to appear in* **Interfaces Free Bound.**

Convergence of regularized nonlocal interaction energies,
(with K. Craig), **SIAM J. Math. Anal.**, 48 (2016), 34–60

2015 *On minimizers of interaction functionals with competing attractive and repulsive potentials,*
(with R. Choksi and R. Fetecau),
Ann. Inst. Henri Poincaré (C) Anal. Non Linéaire, 32 (2015), 1283–1305.

Existence of minimizers of nonlocal interaction energies,
(with R. Simione and D. Slepčev),
J. Stat. Phys., 159 (2015), 972–986.

Axisymmetric critical points of a nonlocal isoperimetric problem on the two-sphere,
(with R. Choksi and G. Tsogtgerel),
ESAIM Control Optim. Calc. Var., 21 (2015), 247–270.

2013 *On a nonlocal isoperimetric problem on the two-sphere,*
Comm. Pure Appl. Anal., 12 (2013), 597–620.

2011 *On the global minimizers of a nonlocal isoperimetric problem in two dimensions,*
(with P. Sternberg),
Interfaces Free Bound., 13 (2011), 155–169.

2008 *Standing waves for a generalized Davey–Stewartson system: Revisited,*
(with A. Eden),
Appl. Math. Lett., 21 (2008), 342–347.

PRESENTATIONS

2016 SIAM Annual Meeting, Boston, MA, 11–15 July 2016.

PIMS Workshop on Nonlocal Variational Problems and PDEs, University of British Columbia, Vancouver, BC, 13–17 June, 2016.

Applied Interdisciplinary Mathematics Seminar, University of Michigan, Ann Arbor, MI, 18 March 2016.

2015 SIAM Conference on Analysis of Partial Differential Equations, Scottsdale, AZ, 7–10 December 2015.

The 8th International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, China, 10–14 August 2015.

Canadian Mathematical Society Summer Meeting, Charlottetown, PE, Canada, 5–8 June 2015.

Departmental Colloquium, New Mexico State University, Las Cruces, NM, 16 April 2015.

PDE and Applied Mathematics Seminar, The University of Akron, Akron, OH, 19 February 2015.

PDE/Analysis Seminar, McMaster University, Hamilton, ON, Canada, 6 February 2015.

2014 Canadian Mathematical Society Winter Meeting, Hamilton, ON, Canada, 5–8 December 2014.

Fields Fall 2014 Postdoctoral Seminars, The Fields Institute for Research in Mathematical Sciences, Toronto, ON, 30 September 2014.

AMS 2014 Spring Western Sectional Meeting, University of New Mexico, Albuquerque, NM, 5 and 6 April 2014.

2013 SIAM Conference on Analysis of Partial Differential Equations, Lake Buena Vista, FL, 7–10 December 2013.

CRM/McGill Applied Mathematics Seminar, McGill University, Montréal, QC, Canada, 18 November 2013

Center for Nonlinear Analysis Seminar, Carnegie Mellon University, Pittsburgh, PA, 15 October 2013.

SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA, 9–12 June 2013.

Analysis and Applied Math Seminar, University of Toronto, Toronto, ON, Canada, 25 January 2013.

2012 Canadian Mathematical Society Winter Meeting, Montréal, QC, Canada, 10 December 2012.

CRM/McGill Applied Mathematics Seminar, McGill University, Montréal, QC, Canada, 24 September 2012.

AMS 2012 Spring Eastern Sectional Meeting, George Washington University, Washington, DC, 17 and 18 March 2012.

Applied Analysis Group Seminar, Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany, 22 February 2012.

2011 PDE/Applied Mathematics Seminar, Indiana University, Bloomington, IN, 5 December 2011.

SIAM Conference on Analysis of Partial Differential Equations, San Diego, CA, 14–17 November 2011.

68th Midwest PDE Seminar, University of Notre Dame, Notre Dame, IN, 4–6 November 2011.

2010 PDE/Applied Mathematics Seminar, Indiana University, Bloomington, IN, 20 September 2010.

2007 SIAM Conference on Analysis of Partial Differential Equations, Mesa, AZ, 10–12 December 2007.

2005 İstanbul Differential Equations Seminars, Koç University, İstanbul, Turkey, 29 June 2005.

Teaching Experience

McMaster University, Hamilton, ON, Canada
Instructor

- MATH 1A03 / 1ZA3 – Calculus for Science I / Engineering Mathematics I

McGill University, Montréal, QC, Canada
Instructor

- MATH 140 – Calculus I
- MATH 141 – Calculus II

Indiana University, Bloomington, IN, United States
Associate Instructor

- M 025 – Precalculus
- M 027 – Precalculus with Trigonometry
- D 116 – Introduction to Finite Mathematics I, part of Groups Scholars Program
- M 118 – Finite Mathematics
- M 211 – Calculus I (Recitations)

Participated in the video project at Indiana University for M 119 Introduction to Calculus. The project involved recording instructional videos to accompany the online homework system. The videos can be accessed via the following links:

http://www.indiana.edu/~video/stream/launchflash.html?folder=mathwhw&filename=M119/HHc1s7_15.mp4
http://www.indiana.edu/~video/stream/launchflash.html?folder=mathwhw&filename=M119/HHc1scompound_5.mp4
http://www.indiana.edu/~video/stream/launchflash.html?folder=mathwhw&filename=M119/HHc2s4_4.mp4
http://www.indiana.edu/~video/stream/launchflash.html?folder=mathwhw&filename=M119/HHc2s5_10.mp4

Boğaziçi University, Istanbul, Turkey
Visiting Instructor and Teaching Assistant

- MATH 105 – Finite Mathematics (Visiting Instructor during Summer School 2011)
- MATH 201 – Matrix Theory (Recitations)
- MATH 202 – Differential Equations (Recitations)
- MATH 231 – Vector Calculus (Recitations)

Workshops Attended

Thematic Program on Variational Problems in Physics, Economics and Geometry, The Fields Institute for Research in Mathematical Sciences, Toronto, ON, Canada, 1 July – 31 December 2014.

CNA Summer School: Topics in Nonlinear PDEs and Calculus of Variations, and Applications in Materials Science, Carnegie Mellon University, Pittsburgh, PA, 30 May – 7 June 2013.

Workshop on Self-Assembly of Block Copolymers: Theoretical Models and Mathematical Challenges, Banff International Research Station for Mathematical Innovation and Discovery, Banff, AB, Canada, 23–28 May 2010.

Workshop on Energy-Driven Systems, CNA, Carnegie Mellon University, Pittsburgh, PA, 27–29 August 2009.

Workshop on the Asymptotic Analysis in the Calculus of Variations and PDEs, Pacific Institute for the Mathematical Sciences, Vancouver, BC, Canada, 6–10 July 2009.

Professional Memberships

American Mathematical Society
Canadian Mathematical Society
Society for Industrial and Applied Mathematics

Service

Referee for the following journals:
Archive for Rational Mechanics and Analysis,
Calculus of Variations and Partial Differential Equations,
Communications in Mathematical Physics,
SIAM Journal of Mathematical Analysis.

Reviewer for AMS Mathematical Reviews.

Co-organizer (with Katy Craig) of the minisymposium series "Nonlocal Interaction Models: Dynamics, Asymptotics and Applications" at the *2015 SIAM Conference on Analysis of PDEs*.

Co-organizer (with Lia Bronsard) of the scientific session "Singularities and Phase Transitions in the Calculus of Variations and PDEs" at the *2015 Canadian Mathematical Society Summer Meeting*.

Co-organizer (with Jun Kitagawa) of Fields Fall 2014 Postdoctoral Seminars during the *Thematic Program on Variational Problems in Physics, Economics and Geometry* at the Fields Institute.

References

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