

YULIA HRISTOVA

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EMPLOYMENT

Department of Mathematics and Statistics, University of Michigan - Dearborn
Assistant Professor September 2012 – present

Institute for Mathematics and Its Applications, University of Minnesota
Postdoctoral Associate August 2010 - August 2012

EDUCATION

Ph.D	Texas A&M University , Dept. of Mathematics Dissertation: <i>Mathematical problems of Thermoacoustic and Compton Camera Imaging</i> Advisor: Peter Kuchment	2010
B.S.	Sofia University “St. Kliment Ohridski” , Bulgaria Mathematics	2002

RESEARCH INTERESTS

Applied inverse problems, numerical analysis and scientific computing.

PUBLICATIONS

Peer-Reviewed Publications

1. Asplund, J., Edoh, K., Haas, R., **Hristova, Y.**, Novick, B., Werner, B., “Reconfiguration graphs of shortest paths,” *Discrete Mathematics*, Vol 341, no. 10, 2018, pp. 2938-2948.
2. Moon, S., **Hristova, Y.**, Kwon, B., “Single Scattering Tomography with Curved Detectors”, *Biomedical Physics and Engineering Express*, Vol 4, no. 4, 045040, 2018.
3. Dong, B., Gottlieb, B., Hristova, Y., Jiang, Y., and Wang, H., *The effect of the sensitivity parameter in weighted essentially non-oscillatory methods*, In S. Brenner (Ed.), Topics in Numerical Partial Differential Equations and Scientific Computing, The IMA Volumes in Mathematics and its Applications, vol. 160, Springer New York, 2016, pp. 23-50.
4. Olson A., Ciabatti A., Hristova Y., Kuchment P., Ragusa J. and Allmaras M., *Passive detection of small low-emission sources - two-dimensional numerical case studies*, Nuclear Science and Engineering, Vol 184, no. 1, 2016, pp 125-150.
5. Hristova Y. and Zeytuncu Y., *Why do we need the derivative for the surface area?*, PRIMUS, 2015, DOI: 10.1080/10511970.2015.1095263.
6. Hristova Y., Moon S. and Steinhauer D., *A Radon-type transform arising in Photoacoustic Tomography with circular detectors: spherical geometry*, Inverse Problems in Science and Engineering, 2015, DOI:10.1080/17415977.2015.1088537.

7. Hristova Y., *Inversion of the V-line transform arising in emission tomography*, Journal of Coupled Systems and Multiscale Dynamics, Vol 3, no. 3, 2015, pp.272-277.
8. Allmaras, M., Darrow, D., Hristova, Y., Kanschat, G. and Kuchment, P. *Detecting small low emission radiating sources*, Inverse Problems and Imaging, Vol 7, no. 1, 2013, pp. 47-79.
9. Hristova, Y., *Time reversal in thermoacoustic tomography - an error estimate*, Inverse Problems, 25 (2009) 055008 (14pp).
10. Hristova, Y., Kuchment P. and Nguyen, L., *On reconstruction and time reversal in thermoacoustic tomography in homogeneous and non-homogeneous acoustic media*, Inverse Problems, 24 (2008) 055006 (25pp).

TEACHING EXPERIENCE

Mentor

<i>University of Michigan - Dearborn</i> , MI	Co-mentor, PIC Math program	Winter 2015, 2016
<i>University of Minnesota</i> , MN	MAXIMA REU, Laser Optics Team	June - July 2012

Instructor

<i>University of Michigan-Dearborn</i> , MI	Complex Variables, Discrete Mathematics for ECE, Fourier Series and Boundary Value Problems, Finite Difference Methods for Differential Equations, Mathematical Modeling, Differential Equations, Calculus I, Calculus II, Calculus III.
<i>University of Minnesota</i> , MN	Calculus I
<i>Texas A&M University</i> , TX	Business Calculus II

Teaching Assistant

<i>Texas A&M University</i> , TX	Calculus I for Engineers, Calculus II for Engineers
<i>Sofia University</i> , Bulgaria	Ordinary Differential Equations

TECHNICAL SKILLS

1. *Languages*: Bulgarian (native), English (fluent), Russian (getting rusty).
2. *Computer Skills*: Matlab, some experience with Mathematica, Python, Maple, HTML, Java and C++.

SERVICE

1. **Organizer** (with H. Kim, F. Massey, J. Remski, and J. Zhao) **GLSIAM Spring Meeting**, University of Michigan-Dearborn, Dearborn, MI, April 30, 2016.
2. **Organizer** (with L. Nguyen), **Special Session on *Inverse Problems and Imaging***, AMS Central Spring Sectional Meeting, Michigan State University, East Lansing, MI, March 14-15, 2015.
3. **Organizer**, **IMA Postdoc Seminar**, University of Minnesota, Fall 2011

4. **Reviewer:** *Inverse Problems, SIAM Journal on Imaging Sciences, Inverse Problems and Imaging, Computers and Mathematics with Applications, Journal of Mathematical Imaging and Vision.*

OUTREACH

1. Led sessions of the Maize and Blue Math Circle, University of Michigan - Dearborn.
2. Served on the **MAA/AMC Contest Panel** for the 2017 AMC8, 2016
3. **Organizer** of the mathematics activities table at the **Math and Science Family Fun Fair**, University of Minnesota, November 19, 2011
4. **Organizer** of the IMA activities table at the **Annual CSE Alumni Homecoming Celebration**, University of Minnesota, October 21, 2011
5. **Organizer** of the IMA's booth at the **Minnesota State Fair**, September 4, 2011

AWARDS

1. **PIC Math** teaching grant, \$3,000, Kim H. (PI), Hristova, Y. (Co-PI), Agarwal, M. (Co-PI), Mathematical Association of America, 2016.
2. **PIC Math** teaching grant, \$5,000, Hristova, Y. (PI), Kim H. (Co-PI), Mathematical Association of America, 2015.
3. **Graduate Teaching Academy Fellow**, Center for Teaching Excellence, Texas A&M University, 2007

RECENT CONFERENCE PRESENTATIONS

1. (invited) *The effect of the sensitivity parameter in weighted essentially non-oscillatory methods*, **SIAM Annual Meeting 2017**, AWM workshop, Pittsburgh, PA, July 2017.
2. *The effect of the sensitivity parameter in weighted essentially non-oscillatory methods*, **GL SIAM 2017 Spring Meeting**, Oakland University, MI, April 2017.
3. (invited) *Photo-acoustic Tomography with Circular Detectors*, **AIMS 2016**, session on Imaging methods in coupled physics models, Orlando, FL, July 2016.
4. *Photo-acoustic Tomography with Circular Detectors*, **GL SIAM 2015 Spring Meeting**, Grand Valley State University, Grand Rapids, MI, May 2015.
5. *Photoacoustic Tomography using circular detectors with a common center*, **Applied Mathematics Conference**, Oakland University, September 2014.
6. (invited) *Detection of low emission radiating sources using direction sensitive detectors*, **Geometric Analysis on Euclidean and Homogeneous Spaces**, Tufts University, January 2012.
7. *Detecting small low emission radiating sources*(poster) with M. Allmaras

- **Large-scale Inverse Problems and Quantification of Uncertainty**, IMA, University of Minnesota, June 2011.
 - **Applied Inverse Problems Conference**, Texas A& M University, May 23, 2011.
8. (invited) *Detection of Low Emission Sources in the Presence of a Large Random Background*, **IAMCS Workshop: Statistical Inverse Problems in the Biosciences**, Institute for Applied Mathematics and Computational Science, College Station, TX, May 21 2011.

RECENT COLLOQUIUM AND SEMINAR PRESENTATIONS

1. *Applications of the V-line Transform in Imaging*
 - **University of Michigan - Dearborn**, Dept. of Mathematics and Statistics Colloquium, April 2016.
 - **Rochester Institute of Technology**, School of Mathematical Sciences Colloquium, April 2016.
2. *Some new problems in emission tomography*, Applied Mathematics Seminar, **Wayne State University**, November 2012.
3. *Computed Tomography: Seeing the Invisible*, Math Club seminar, Department of Mathematics and Statistics, **University of Michigan-Dearborn**, November 2012.
4. *Mathematical Problems in Emission Tomography*, Department of Mathematics Colloquium, **University of Idaho**, April 2012.
5. *Some Mathematical Problems in Computerized Tomography*, **Warren Lecture Series**, Department of Civil Engineering, **University of Minnesota**, February 2012.

OTHER SELECTED CONFERENCES AND WORKSHOPS

1. **Phaseless Imaging in Theory and Practice: Realistic Models, Fast Algorithms, and Recovery Guarantees**, IMA, Minnesota, MN, August 2017.
2. **REUF 2016 workshop**, American Institute of Mathematics (AIM), San Jose, CA, July 2016.
3. **Computational and Analytical Aspects of Image Reconstruction**, ICERM, Brown University, Providence, RI, July 2015.
4. **Hybrid Methods in Imaging**, BIRS, Banff, Alberta, Canada, June 2015.
5. **AMS Central Spring Sectional Meeting**, Michigan State University, East Lansing, MI, March 2015.
6. **Inverse Problems and Spectral Theory**, Texas A&M University, College Station, TX, Oct. 2014.
7. **WhAM! A Research Collaboration Workshop for Women in Applied Mathematics: Numerical Partial Differential Equations and Scientific Computing**, IMA, University of Minnesota, Minnesota, MN, Aug. 2014.
8. **NSF-CBMS Conference on Mathematical Methods of Computed Tomography**, University of Texas at Arlington, Arlington, TX, May 2012.

9. **Nonlinear solvers for high-intensity focused ultrasound with application to cancer treatment**, American Institute of Mathematics, Palo Alto, CA, April 2012.
10. **Joint Mathematics Meetings**, Boston, MA, January 2012.
11. **Careers in Academia workshop**, American Institute of Mathematics, Palo Alto, CA, June 2011.
12. **Inverse Problems: Theory and Applications**, Mathematical Sciences Research Institute, Berkeley, CA, November 2010.
13. **Connections for Women: Inverse Problems and Applications**, Mathematical Sciences Research Institute, Berkeley, CA, August 2010.
14. **Mathematical Methods in Emerging Modalities of Medical Imaging**, Banff International Research Station, Banff, AB, Canada, October 2009.
15. **Mathematical Modeling in Industry XIII workshop**, Institute for Mathematics and its Applications, Minneapolis, MN, August 2009.
16. **AMS, Mathematics Research Communities**, Workshop Theme: **Inverse Problems**, Snowbird, UT, June 2009.