

YULIA HRISTOVA

Department of Mathematics and Statistics
University of Michigan-Dearborn

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EMPLOYMENT

Department of Mathematics and Statistics, University of Michigan - Dearborn
Associate Professor September 2019 – present

Department of Mathematics and Statistics, University of Michigan - Dearborn
Assistant Professor September 2012 – September 2019

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

EDUCATION

Ph.D	Texas A&M University , Mathematics	2010
B.S.	Sofia University “St. Kliment Ohridski” , Mathematics	2002

RESEARCH INTERESTS

Applied inverse problems with emphasis on imaging, numerical analysis, and scientific computing.

AWARDS AND FUNDING

1. Sister Mary Ambrosia Fitzgerald Mentoring Award, University of Michigan, 2024.
2. “GirlsGetMath@Dearborn”, \$5,325, Hristova, Y. (Project Director), Kim, H., Viswanathan, A., Mathematical Association of America, Tensor Program for Women and Mathematics, 2024.
3. “GirlsGetMath@Dearborn”, \$6,000, Hristova, Y. (Project Director) and Kim, H., Mathematical Association of America, Tensor Program for Women and Mathematics, 2023.
4. “GirlsGetMath@Dearborn – A summer math camp for high school students,” \$5,300, Hristova, Y. (Project Director) and Viswanathan, A., Institute for Computational and Experimental Research in Mathematics (ICERM; Brown University) and JetBlue Foundation, 2022.
5. MATCH Fellow, \$500, AY 2021 - 2022, American Institute of Mathematics.
6. “Collaborative Research: RUI: Computational Ptychography: Fast Algorithms, Recovery Guarantees, and Applications to Bio-Imaging,” \$165,904 (U of M - Dearborn share), Viswanathan, A. (PI), Hristova, Y. and Zheng, G. (Co-PIs), National Science Foundation (Computational Mathematics program), 2020-2023.
7. Mathematical Sciences Sponsorship grant for organizing GirlsGetMath@Dearborn, \$4,000, Hristova (PI), Y., Elsevier, 2020.
8. *OER Remixing Grant*, \$1500, Dabkowski, M. and Hristova, Y., University of Michigan-Dearborn, 2019.
9. *PIC Math* teaching grant, \$3,000, Kim H. (PI), Hristova, Y. (Co-PI), Agarwal, M. (Co-PI), Mathematical Association of America, 2016.
10. *PIC Math* teaching grant, \$5,000, Hristova, Y. (PI), Kim H. (Co-PI), Mathematical Association of America, 2015.

SELECTED PUBLICATIONS

1. Hume*, J., McDonald*, D., Newman*, A., Liveoak*, D. Hristova, Y., Viswanathan, V. “Edge-informed estimation of gaussian point spread functions in convolutional blurring models,” NIST/IEEE Conference on Computational Imaging using Synthetic Apertures, 2024. *Undergraduate students

2. Baker*, N., Flynn*, J., Mousley*, J., Hristova, Y., Viswanathan, V. "Eigenvector based block vector synchronization with applications to ptychographic imaging," NIST/IEEE Conference on Computational Imaging using Synthetic Apertures, 2024. *Undergraduate students
3. Kim, J., Moon, S. and Hristova, Y., "Photoacoustic tomography with line detector: Exact inversion formula," *Journal of Mathematical Analysis and Applications*, Volume 500, no. 2, 125119, 2021.
4. Cordor*, C., Williams*, B., Y. Hristova and A. Viswanathan, "Fast 2D Phase Retrieval using Bandlimited Masks," in Proceedings of the 28th European Signal Processing Conference (EUSIPCO), Amsterdam, Netherlands, pp. 980-984, Aug. 2020. *Undergraduate students
5. 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.
6. Moon, S., Hristova, Y., Kwon, B., "Single Scattering Tomography with Curved Detectors", *Biomedical Physics and Engineering Express*, Vol 4, no. 4, 045040, 2018.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. Hristova, Y., *Time reversal in thermoacoustic tomography - an error estimate*, Inverse Problems, 25 (2009) 055008 (14pp).
13. Hristova, Y., Kuchment P. and Nguyen, L., *Reconstruction and time reversal in thermoacoustic tomography in acoustically homogeneous and inhomogeneous media*, Inverse Problems, 24 (2008) 055006 (25pp).

STUDENT SUPERVISION

1. Directed *Masters Projects* of Carolyn Kaufmann (*Control of Nosema Infection in Honeybees*), Nicole Hayes (*Numerical Methods and Noise in a Filtered Back Projection-Type Reconstruction Method for Thermoacoustic and Photoacoustic Tomography*, David Like (*X-ray Tomography and Associated Applications*). Co-directed M.S. project of Rita Wanjiku (*The Gerchberg-Saxton Algorithm with Applications to Phase Retrieval*) .
2. Co-Mentored (with A. Viswanathan) groups of 2-4 students on projects in mathematical signal/image processing and inverse problems at University of Michigan - Dearborn, Summer REU 2019, 2021, 2022, 2023, Undergraduate Research Groups W 2021 - present.
3. Co-mentored (with H. Kim) a group of 3 students on a project "Frequency Response of Blood Flow Autoregulation," as part of the PIC Math program at University of Michigan - Dearborn, W 2016.
4. Co-mentored (with D. Flath) a group of 4 students on a project on modeling and simulation of coupled laser cavities, MAXIMA Summer REU, University of Minnesota, 2012.

SELECTED OUTREACH

Math Kangaroo Center manager, University of Michigan - Dearborn	Winter 2023, 2024
GirlsGetMath@Dearborn - annual summer math camp for high school students, project director	2021 - 2024
MATCH Fellow, online visits to mathematics classes, Wyandotte Middle School, OK	Fall 2021

TEACHING EXPERIENCE AT UNIVERSITY OF MICHIGAN-DEARBORN

Complex Variables, Mathematical Modeling, Fourier Series and Boundary Value Problems, Finite Difference Methods for Differential Equations, Dynamical Systems, Introductory Differential Equations, Discrete Mathematics for Computer Engineers, Calculus I, Calculus II, Calculus III.

SELECTED SERVICE

Program Director, Applied and Computational Mathematics M.S., UM-Dearborn, 2019-2020, 2022 - present

Member, *AWM Essay Contest Committee*, Feb 2022 - Jan 2025

Member, *AWM Chat with a Mathematician Committee*, Feb 2024 - Jan 2027

Organizer (with A. Viswanathan) Mathematics of Signal Processing, Optimization and Inverse problems", 2018 SIAM Annual Meeting, Portland, OR, July 13, 2018.

Organizer (with H. Kim, F. Massey, J. Remski, and J. Zhao), *GLSIAM Spring Meeting*, University of Michigan-Dearborn, Dearborn, MI, April 30, 2016.

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.