Joseph John Klobusicky

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Summary

Current Position: **Associate Professor** at The University of Scranton. Department of Mathematics.

Research Interests: Modeling in **applied probability and analysis**, with applications in

- Microstructure in materials science
- Stochastics and dynamics in biology

Other interests: Machine learning, medical informatics, self-assembly, microfluidics.

Education

May 2014	Ph.D. in Applied Mathematics, **Brown University**, Providence, RI **Thesis**: *Kinetic limits of piecewise deterministic Markov processes and grain boundary coarsening* **Advisor**: Prof. Govind Menon
May 2010	Sc.M. in Applied Mathematics, **Brown University**, Providence, RI
May 2009	M.S. in Mathematics, **Carnegie Mellon University**, Pittsburgh, PA
May 2009	B.S. in Mathematics, **Carnegie Mellon University**, Pittsburgh, PA

Previous Appointments

Sept 2020-May 2025	Assistant Professor at The University of Scranton, Department of Mathematics
Sept 2019-June 2020	National Research Council (NRC) Postdoctoral Fellow at National Institute of Standards and Technology (NIST)
Sept 2016-June 2019	RTG Postdoctoral Researcher at Rensselaer Polytechnic Institute
Sept 2015-May 2016	Lecturer at Bucknell University
May 2014-August 2016	Data scientist/applied mathematician at Geisinger Medical Center, Danville, PA
August 2010-May 2012	Teaching assistant at Brown University

Courses

Numerical Methods (Fall 2023, '25)
Actuarial Mathematics (Spring 2023, '25)
Quantitative Methods III (Spring 2023-24)
Quantitative Methods II (Fall 2022-24, Fall 2025)
Magis Honors Program Seminar (Fall 2024)
Mathematical Methods for Data Science (Spring 2021,'22,'24, '25)
Calculus I (Fall 2020-21, Spring 2021, 2023)
Calculus II (Spring 2022)
Introduction to Data Science (Fall 2020-22)
Introduction to Differential Equations (Fall 2018, Spring 2017-19)
Probability Theory with Applications (Fall 2016-17)
Introduction to Mathematical Modeling (Spring 2016)
Introduction to Statistics (Fall 2015)

Publications **(for preprints, please visit joeklobusicky.net)**

Stochastic Fluctuations of the Facultative Endosymbiont Wolbachia due to Finite Host Population Size. Jason M. Graham, Joseph Klobusicky, and Michael TJ Hague. Ecology and Evolution 15.8 (2025): e71989.

Planar network statistics for two-dimensional rupturing foams. Joe Klobusicky, Elif Onat and Visilios Konstantinou. Physical Review E 110.5 (2024): 054609.

An S-Box construction from exponentiation in finite fields and its application in RGB color image encryption. Steven Dougherty, Joseph Klobusicky, Serap Şahinkaya, and Deniz Ustun. Multimedia Tools and Applications (2023): 1-29.

Concentration inequalities for the hydrodynamic limit of a two-species stochastic particle system. Joseph Klobusicky. Discrete and Continuous Dynamical Systems-B 28.7 (2023): 4231-4260.

Markov models of coarsening in two-dimensional foams with edge rupture. Joseph Klobusicky. Journal of Nonlinear Science 31.2 (2021): 1-27.

Two-dimensional grain boundary networks: stochastic particle models and kinetic limits. Joe Klobusicky, Govind Menon and Robert Pego. Archive for Rational Mechanics and Analysis 239 (1), (2021), 301-355.

Convergence of backpropagation with momentum for network architectures with skip connections. Chirag Agarwal, Joe Klobusicky, and Dan Schonfeld. Journal of Computational Mathematics. J. Comp. Math., 39 (2021), pp. 147-158.

Effective behavior of cooperative and nonidentical molecular motors. Joe Klobusicky, Peter Kramer, and John Fricks. Research in the Mathematical Sciences 7.4 (2020): 1-49.

Concentration inequalities for a removal-driven thinning process. Joe Klobusicky, Govind Menon. Quart. Appl. Math. 75 (2017), pp. 677-696.

Aberrations in the iron regulatory gene signature are associated with decreased survival in

diffuse in infiltrating gliomas. Joe Klobusicky, Cody Weston, Jennifer Weston, James Connor, Steven A. Toms and Nicholas F. Marko. PLoS One. 11.11(2016): e0166593.

Building polyhedra by self-folding: theory and experiment. Ryan Kaplan, Joe Klobusicky, Shivendra Pandey, David H. Gracias, and Govind Menon. Artificial Life. Vol. 20, Issue 4, Fall 2014, pp. 409-439.

Self-assembly of mesoscale isomers: the role of pathways and degrees of freedom. Shivendra Pandey, Daniel Johnson, Ryan Kaplan, Joe Klobusicky, Govind Menon, and David H. Gracias. PloS One, 9.10 (2014): e108960.

(Conference Publications)

A network-theoretic analysis of hospital admission, transfer, and discharge data. Joe Klobusicky, Maria Cioffi, Naba Mukhtar, Nathan C. Ryan. In AMIA Summit on Clinical Research Informatics Proceedings. Vol. 2018, pp. 45-53.

Evolving patient compliance trends: integrating clinical, insurance, and extrapolated socioeconomic data. Joe Klobusicky, Arun Aryasomayajula. and Nicholas F. Marko. In AMIA Annual Symposium Proceedings. Vol. 2015, pp. 766-774.

Organizational/Committee Activities

Organizer: University of Scranton Data Science Competition (2022-present).

Neuroscience Advisory Council (2021-present).

College of Arts and Science representative. General Education Review Committee (2023-present).

Faculty Senate Curriculum Committee (2022-2023).

Organizer: RTG/Dyanamical Systems Seminar. (Fall 2017-Spring 2019).

Assistant coach: Mathematical and Interdisciplinary Contest in Modeling (2016-2019).

Instructor at *Brown/Kobe University Supercomputing Summer School* (Summer 2013) .

Awards/Grants

NASA PA Space Grant. 2025-2028.
Faculty Development Grant (Internal). "Generating microstructure with machine learning". Intersession 2025.
NASA PA Space Grant. Year 5 Extension. Co-PI. 2023-2024.
NSF LEAPS-MPS. PI. "Network statistics of rupturing foams". 2024-2025.

NASA PSGC mini-grant. PI. "Phase transitions in two-dimensional foams". 2022-2023.

PA GOAL Grant. Co-PI. Awarded for development of open source materials for data science and statistics courses. 2021-2022.

Geisinger/Bucknell University BGRI grant. Co-PI. "A graph theoretic method for detecting sepsis". 2015- 2016.

Dunmu Ji Award. Brown University. Awarded for recognition of a particularly original and independent doctoral thesis.

Presentations

7th Annual tecBRIDGE Innovation Conference. August 2025.
SIAM Annual Meeting. Montreal, CA. July 2025
Joint Mathematics Meetings. Seattle, WA. January 2025.
SIAM NNP Regional Conference. Rochester, NY. November 2024.
SIAM Annual Meeting. Spokane, WA. July 2024.

SIAM Mathematical Aspects of Materials Science. Pittsburgh, PA. May 2024.

2023 SIAM Dynamical Systems. Portland, OR. May 2023.

UNISON/ASU Stochastic Modeling Seminar (online). February 2023.

Joint Mathematics Meetings. Boston, MA. January 2023.

Faculty Seminar Series. University of Scranton. October 2022.

Joint Math Meetings. Virtual. January 2022.

King's College Math Colloquium. Wilkes Barre, PA. November 2021.

WCCM & ECCOMAS Congress. Virtual (Originally planned in Paris). November 2020.

University of Scranton. Scranton, PA. January 2020.

ICIAM 2019. Valencia, Spain. July 2019.

11th IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena. Athens, GA. April 2019.

College of Charleston. Charleston, SC. March 2019.

University of California, Santa Barbara. Santa Barbara, CA. March 2019.

California State Univeristy, Fullerton, Fullerton CA. February 2019.

Lake Forest College. Lake Forest, IL. February 2019.

Joint Mathematics Meetings. Baltimore, MD. January 2019.

University of Southern Florida. Tampa, FL. January 2019.

University of Southern Connecticut. New Haven, CT. December 2018.

Lefschetz Center for Dynamical Systems Seminar. Brown University. Providence, RI. August 2018.

SIAM Life Sciences 2018. Minneapolis, MN. August 2018.

Mechbio Conference 2018. Poster. UC Irvine. Irvine, CA. July 2018.

SIAM Mathematical Aspects of Material Science. Portland, OR. July 2018.

Biology and Medicine Through Mathematics. Virginia Commonwealth University. Richmond, VA. June 2018.

Mathematics Colloquium. University of New Mexico. May 2018.

Frontier Probability Days. Oregon State University. Corvallis, OR. April 2018.

AMIA 2018 Informatics Summit. San Francisco, CA. March 2018.

Society of Mathematical Biology Annual Meeting. Salt Lake City, UT. July 2017.

Frontiers in Applied and Computational Mathematics 2017. New Jersey Institute of Technology. Newark, NJ.June 2017.

2017 SIAM Dynamical Systems. Minisymposium organizer for "Random Dynamics in Molecular Biology". Snowbird, UT. May 2017.

10th IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena. Athens, GA. April 2017.

Joint Mathematics Meetings 2017. Atlanta, GA. January 2017.

AIMS 2016. Orlando, Florida. July 2016.

SIAM Mathematical Aspects of Material Science. Philadelphia, PA. May 2016.

Applied Math Days. RPI. Troy, NY. April 2016.

RTG Seminar. RPI. Troy, NY. February 2016.

Student Talk Series. Bucknell University. Lewisburg, PA. February, 2015.

Bucknell University/Geisinger Lecture Series. Bucknell University. Lewisburg, PA. January, 2015.

Lefschetz Center for Dynamical Systems Seminar. Brown University. Providence, RI. February 2014.

Graduate Student Seminar. Brown University. Providence, RI. November 2013.

Poster. NSF Building Engineered Complex Systems Workshop. Washington D.C.. January 2013.