FARIS EL-KATRI
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RESEARCH INTERESTS

- Nonlinear hyperbolic partial differential equations
- Hyperbolic systems of conservation laws
- Compressible fluid dynamics and the Euler equations
- Shock formation and singularity development
- Radar signal processing

PROFESSIONAL EXPERIENCE

Graduate Teaching Assistant – Department of Mathematics
University of Kansas
August 2022 – December 2023, August 2025 – Present

Assisted in undergraduate instruction and coursework across multiple mathematics courses.

Graduate Research Assistant – Department of Mathematics
University of Kansas
January 2024 – May 2024, May 2026 – August 2026

Conducted mathematics research under Professor Geng Chen, focusing on partial differential equations as applied to gas dynamics.

Student Trainee – United States Naval Research Laboratory
Washington, DC
December 2024 – August 2025

Conducted research as a graduate student in the Radar Division under Dr. Daniel Scholnik.

Graduate Research Assistant – Radar Systems Laboratory
University of Kansas
August 2023 – May 2025

Graduate research assistant under Professor Patrick McCormick focusing on radar systems and signal processing.

Graduate Research Assistant – Garrison Flight Research Center
University of Kansas
May 2023 – August 2023

Conducted research in control theory as applied to unmanned aerial systems.

EDUCATION

Ph.D. in Mathematics *(In Progress)*
University of Kansas
Expected Graduation Date: May 2027

M.S. in Electrical Engineering
Thesis Title: *Source Separation using Sparse Bayesian Learning*
University of Kansas
May 2025

M.A. in Mathematics
University of Kansas
May 2024

B.S. in Mathematics
University of Southern California
May 2021
Graduated Summa Cum Laude

Dual Enrollment Studies Concurrent with High School
Georgia Institute of Technology
August 2016 – May 2018

PUBLICATIONS

Journal Articles

1. **Geng Chen, Faris El-Katri, Shoujun Huang.**
   Development of singular surfaces and formation of generic singularities in 3D pressureless flows. Submitted.
2. **Faris El-Katri**.
   Long-Time Nonlinear Stability of Large-Amplitude Radial Rarefactive Flows for the Multidimensional Compressible Euler Equations. Submitted.
3. **Geng Chen, Faris A. El-Katri, Yanbo Hu.**
   Existence and singularity formation for the supersonic expanding wave of radially symmetric non-isentropic compressible Euler equations.
   Nonlinearity, July 2026.
4. **Eduardo Abreu, Geng Chen, Faris El-Katri, Erivaldo Lima.**
   Complex Dynamics of Wave-Character Transitions in Radially Symmetric Isentropic Euler Flows: Theory and Numerics. Submitted.
5. **Geng Chen, Faris El-Katri, Yanbo Hu, Yannan Shen.**
   Singularity formation for the supersonic inward wave of compressible Euler equations with radial symmetry. Submitted.

6. **Geng Chen, Faris El-Katri, Yanbo Hu, Yannan Shen.**
   Global solution and singularity formation for the supersonic expanding wave of compressible Euler equations with radial symmetry.
   Journal of the London Mathematical Society, June 2025

Conference Papers

1. **Faris Ahmed El-Katri, Patrick M. McCormick.**
   Source Separation Using Time-Frequency and Range-Doppler Basis Functions with Sparse Estimation.
   IEEE International Radar Conference, Atlanta, GA, May 5–9, 2025
2. **Patrick M. McCormick, Faris Ahmed El-Katri.**
   Radar and Communications Source Separation via Sparse Time-Frequency Estimation.
   International Radar Conference, Rennes, France, October 21–25, 2024

TEACHING EXPERIENCE

University of Kansas

- Precalculus—Instructor of Record, Fall 2026
- Business Calculus 1—Instructor of Record, Spring 2026
- Business Calculus 1—Instructor of Record, Fall 2025
- Numerical Analysis Qualifying Exam Study Group Leader—Summer 2024
- Business Calculus 1—Instructor of Record, Fall 2023
- Business Calculus 1—Instructor of Record, Spring 2023
- College Algebra—Instructor of Record, Fall 2022

University of Southern California

- Number Theory—Grader, Fall 2020

CONFERENCES ATTENDED

1. **Singularity Formation and Propagation in Gas Dynamics**, Toronto, CA, May 2026
2. **Workshop on Fluid Mechanics,** Lincoln, NE, April 2026
3. **Tri-Service Military Sensing Symposium – Radar Conference**, June 2025
4. **IEEE International Radar Conference**, Atlanta, GA, May 2025
5. **DARPA Young Faculty Award PI Meeting**, Arlington, VA, October 2024
6. **IEEE International Radar Conference**, Denver, CO, May 2024