Christopher L. Cox

epistibrain.github.io

Contact Information

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Research Interests

My research aims to broadly understand particle collisions and the corresponding billiard models. Using analytic and computational techniques, I am working to fill in a narrative beginning with a physically motivated geometric model, leading to the dynamics of the consequent billiards, and opening the door to more general statistical mechanical applications. Of particular interest are no-slip billiards, in which angular and linear momentum may be conservatively exchanged at collisions, and non-holonomic billiards, a related model arising from systems in which particles roll without sliding.

Employment

University of Delaware

Temporary Assistant Professor of Mathematics 2017-2018, 2020-present

Tarleton State University

Assistant Professor of Mathematics 2018-2020

Washington University in St. Louis

Postdoctoral Teaching Fellow 2016-2017

Illinois Central College

Professor of Mathematics 1998-2011

Education

Washington University in St. Louis Ph.D. in Mathematics 2016

Northwestern University M.S. in Mathematics 1994

Williams College B.A. Cum Laude, with honors in Mathematics 1992

Selected Publications

C. Cox, R. Feres, B. Zhao, *Rolling Systems and their Billiard Limits*, Regular and Chaotic Dynamics, 26 (2) 2021.

T. Chumley, S. Cook, C. Cox, R. Feres, *Rolling and no-slip bouncing in cylinders*, Journal of Geometric Mechanics, 12 (1) 2020.

C. Cox, R. Feres, H.-K. Zhang, *Stability of periodic orbits of no-slip billiards*, Nonlinearity, 31 (10), 2018, 4433-4471.

C. Cox, R. Feres *No-slip billiards in dimension two*, Dynamical Systems, Ergodic Theory, and Probability: in Memory of Kolya Chernov, Contemporary Mathematics, vol. 698, Amer. Math. Soc., Providence, RI, 2017, 91-110.

M. Correia, C. Cox, H.-K. Zhang, *Ergodicity in umbrella billiards*, New Horizons in Mathematical Physics, 1 (2), 2017, 56-67.

C. Cox, R. Feres, *Differential geometry of rigid bodies collisions and non-standard billiards,* Discrete and Continuous Dynamical Systems A 36 (11), 2016, 6065-6099.