MARC RYSER, Department of Mathematics, Duke University
Of noise and cancer

In the first part of my talk I will give an overview of my dissertation work on the well-posedness of the 2D stochastic Allen-Cahn equation. I will tell the whole tale, from numerical investigations and formulation of a conjecture to heuristic arguments and the conjecture-turned-theorem.

In the second part of my talk I will present ongoing work at the interface of mathematics and cancer biology. I will introduce a stochastic model of carcinogenesis, and show how a combination of analysis and simulations are used to address clinically relevant problems. To finish, I will talk about an ongoing collaboration with cancer surgeons at Duke, where we develop a modeling framework to make patient-specific predictions.