Michigan Math Club

Thursday at 4pm in the Nesbitt Room
Free Pizza and Pop

Visualizing Complex Functions with Phase Plots

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Have you ever wondered what the graph of a complex valued function looks like? Given a function $f : \mathbb{C} \to \mathbb{C}$, we paint each point w in the complex plane with a ROYGBIV color based on the angle $\theta \in [0, 2\pi)$ in the polar coordinate representation of the number $f(w) = re^{i\theta}$. We call such a coloring of the complex plane a *phase plot* of the function f. Many beautiful theorems in complex analysis come to life through phase plots and these beautiful images have led to new questions. For example: Can we detect where the roots of the derivative f lie based on the phase plot of f? (Answer: Yes!)

The wonderful world of phase plots will be demonstrated using an interactive complex function visualizer. By the end of the talk, the speaker will have exposed the audience to ongoing research questions in which phase plots are an essential tool.