



UNIVERSITY OF RHODE ISLAND

Department of Mathematics  
and Applied Mathematical Sciences



## Applied Mathematics and Scientific Computing Seminar

**Location:** Lippitt Hall **201**

**Time:** Wednesday, April 24, 2024, **2:00pm**

(refreshments at 1:55 p.m.)

### Self-Similarity of Misiurewicz Maps in the Cubic Parameter Curves

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**Abstract:** In the study of Complex Dynamics over the past 100 years, quadratic polynomials have been a major object of fascination, particularly the connection between the parameter space and dynamical pictures of such maps. Tan Lei, and later Kawahira, proved a particularly strong connection for quadratic maps defined at Misiurewicz points known as self similarity. It was shown that zooming into the Julia set of a Misiurewicz point was the same as zooming into the Mandelbrot set around the same point. In this talk, we endeavor to explore the parallel notion of self similarity at Misiurewicz maps in the case of cubic polynomials. After a brief introduction to the technology involved in the study of complex dynamics, the focus will shift to Milnor's definition of the period  $p$  superattracting curves within the parameter space of cubic polynomials. It will be shown that, using Kawahira's proof as a template, a statement about self-similarity in the space of cubic polynomials can be deduced. This result adds to a growing list of properties of the Mandelbrot set that have been extended into the cubic parameter curves.