



DEPARTMENT OF MATHEMATICS

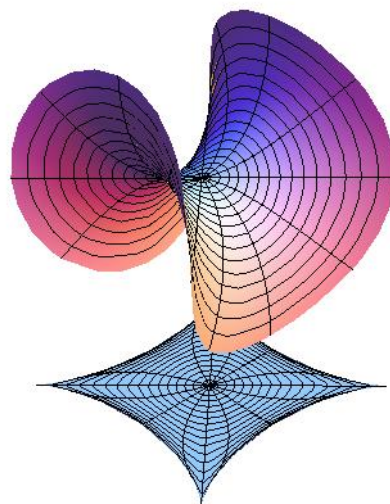
Fall 2024 Colloquium Series

# Zeros of a Family of Complex-Valued Harmonic Polynomials

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In 1984, Clunie and Sheil-Small published a paper in which complex analytic functions were generalized to complex-valued harmonic functions. Since then, mathematicians have investigated how properties of analytic functions are affected when those properties are applied to complex-valued harmonic functions. In this talk, we will look at the property of the number of roots for polynomials. In the analytic case, the Fundamental Theorem of Algebra establishes that a polynomial of degree  $n$  with complex coefficients has exactly  $n$  roots in the complex numbers. That's delightful! What happens to the number of zeros when we move from an analytic polynomial of degree  $n$  to a complex-valued harmonic polynomial of degree  $n$ ? Spoiler Alert - the answer is unexpected; it doesn't have to be  $n$ . Come to the talk to find out more. Disclosure: Such unsolved problems make suitable research problems for undergraduate students who only have a Calculus I background.



October 3, 2024  
Thursday

4:00 pm  
BSS 166

FOR MORE INFO GO TO [HTTPS://MATH.HUMBOLDT.EDU/GET-INVOLVED/MATHEMATICS-COLLOQUIUM](https://math.humboldt.edu/get-involved/mathematics-colloquium)

WE CORDIALLY INVITE YOU TO THE PRE-COLLOQUIUM TEA IN BSS 312  
AT 3:30 PM