Public Lecture, UNM-PNM Statewide High School Mathematics Contest 2025-2026

What Do Ecosystems Look Like? Geometry in Evolution and Ecology

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Abstract. How do scientists make sense of ecosystems made up of hundreds, or even thousands, of interacting species? Whether we're studying the evolution of birds or the microbes living in soil, one surprising tool keeps showing up: geometry.

In this talk, we'll explore how biologists and mathematicians use shapes, distances, and networks to understand complex biological systems. We'll see how DNA data and ecological measurements can be turned into geometric pictures that reveal relationships among species, track evolutionary history, and uncover patterns in microbiomes.

Profile. Professor Gross researches at the intersection of mathematics, statistics, and biology. Her work on phylogenetics draws on techniques in algebraic geometry and algebraic statistics. Her applied work also focuses on chemical reaction networks and neuroscience. In pure mathematics she studies toric ideals and combinatorial commutative algebra. Professor Gross earned her PhD from the University of Illinois at Chicago and was a National Science Foundation (NSF) Postdoctoral Fellow at North Carolina State University. She received a 2019 NSF CAREER award. The CAREER program offers NSF's most prestigious awards in support of early-career scientists.

10:00-11:00 AM, Saturday, 14 February 2026
Auditorium, SMLC 102, UNM Campus
All are welcome!