PHYSICAL MATH SEMINAR

The Colorful World of Birds and Their Eggs: Insights from Evolution, Engineering and Math

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ABSTRACT:

Birds evolved about 150 million years ago, and today they are the most diverse and colorful land vertebrates. In my group, we are fascinated by the ecological and evolutionary processes that contribute to avian diversity. We currently study the avian egg, a remarkable structure that is built to break. From an evolutionary perspective, bird eggs are intriguing because they come in a variety of shapes, sizes, colors, and structures even though they serve the same essential function: to nourish and protect the chick. From an engineering perspective, eggshell is impressive because it is a strong, lightweight material that must serve two competing biomechanical functions. I will describe a project on the evolution of egg shape—plus some new ideas about eggshell structure—incorporating perspectives from evolution, engineering and math. We also study avian coloration and color vision—especially in wild hummingbirds. I will highlight some recent projects that give a glimpse into the colorful world of birds, with insights from mathematical modeling, optics and soft matter.

TUESDAY, DECEMBER 10, 2024

2:30 PM – 3:30 PM

Building 2, Room 449

MIT MATHEMATICS

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