

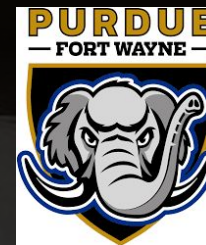


BALL STATE
UNIVERSITY

The Mathematical Laws of Morphology and Biomechanics

Thursday 8th December 2022 11am EST

Virtual Presentation: <https://purdue.webex.com/meet/aselvite>



Prof. Derek Moulton

University of Oxford

Mathematical Institute

The Morphomechanical Basis of Seashell Form

Seashells have intrigued scientists and mathematicians alike for centuries. Seashells are secreted by mollusks, which form the 2nd largest phylum in the animal kingdom. Shell secretion occurs at the shell opening by a soft tissue called the mantle, a relatively simple growth process that is conserved across the more than 100,000 shell-bearing mollusks. And yet, this process generates a huge diversity of shell form, making shells an ideal case study for examining mechanisms of development and questions of evolutionary convergence and divergence. In this talk, I will present a mathematical framework for modelling shell morphogenesis, based on the physical interaction of the soft body of the mollusk and the rigid shell in which it is constrained to live and which it is itself secreting. I will demonstrate how a small a degree of mismatch between growth and secretion is the key ingredient giving rise to many of the beautiful and intricate structures seen in shells.



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