

Evolution of the bivalve shell across shifting climates: insights from microCT and prospects for synchrotron X-ray imaging

== Abstract ==

The shells of molluscs, particularly the calcium carbonate shells of bivalves (clams, cockles, mussels, oysters, etc.), carry rich biological information. The bivalve shell reveals aspects of how the animal lived, its energetics, its heritage, and much more—and, thanks to the shell's durability, the evolutionary history of this animal class can be traced back more than half a billion years. Using micro-CT, my team is analyzing evolutionary changes in the body morphology of thousands of these animals. But it's becoming clear that more precise information about how these animals lived, evolved, and responded to largescale environmental changes is lying beneath the shell's surface. Variations in growth rate, microstructures, and mineral polymorphs can likely be resolved with high-energy phase-contrast X-ray imaging: providing important, metabolic axes of selection to measure on these animals across past mass extinctions and major climatic changes.