



How does mechanics shape morphology? Studies into the influence of function on the evolution of bird beaks and mammal jaws.

Thursday, May 13th: 12pm ET

Prof. Emily Rayfield



Throughout their evolutionary history animals have evolved a multitude of shapes and sizes. It is assumed that these morphologies are intrinsically linked to the function and ecology of the organism as shaped by natural selection. However other factors such as contingency and constraints may influence the evolution of morphological variation. The focus of this seminar is how quantification of animal form and function can address why organisms are shaped in the way they are, and how and why do certain shapes evolve? I will discuss recent work from our lab in which we draw on digitisation methods such as computed tomography and surface scanning combined with biomechanical principles and methods drawn from engineering structural analysis to understand the relationship between skull mechanics and skull morphology. In particular, I will assess the evolutionary relationship between beak shape in birds and jaw shape in mammals to jaw mechanics, feeding ecology and craniofacial integration.

Prof. Emily Rayfield received her first degrees in Biological Sciences at Oxford University, followed by a PhD at Cambridge, a research fellowship at Emmanuel College, and a postdoctoral appointment at the Natural History Museum in London. Currently, she is a Professor in Palaeobiology in the School of Earth Sciences at the University of Bristol. Her research focuses on the functional anatomy of living and extinct vertebrates, incorporating computational methods such as finite element analysis (FEA) together with computed tomography (CT) scans. Among other awards, Prof. Rayfield won the Zoological Society of London Scientific Medal in 2020, the Geological Society of London Bigsby Medal in 2019, and was president of the Society of Vertebrate Paleontology (2018–2020).

Hosted by the [Soft Math Lab](#).

Contact: Irina Tolkova

Email: itolkova@g.harvard.edu

[Zoom registration](#)