UC **SANTA BARBARA**

Department of Earth Science

Speakers Club

WEBB 1100 • THURSDAY April 18th. • 2:00 PM

A new fossil skull gets to the root of pinnipedimorph tooth evolution

Christopher Everett
Department of Earth Science
UC Santa Barbara

Today's seals, sea lions, and walruses, which we call pinnipeds, share common ancestry with terrestrial carnivorans like dogs, bears, and weasels, likely diverging in the early Oligocene. Pinnipeds and their early ancestors, known collectively as pinnipedimorphs, went through a remarkable evolutionary transition to aquatic environments. Though flippers are the most apparent pinniped adaptation for aquatic life, the teeth show an equally extreme functional shift toward a new feeding strategy. These transitions can be observed in the fossil record of early pinnipedimorphs preserved in late Oligocene and early Miocene beds of the eastern Pacific. This talk will focus on a new fossil skull from the Olympic peninsula of Washington, its relationship to other pinnipedimorphs, and its bearing on pinniped tooth evolution.

Litopterns: New Species and Why Phylogeny Matters

Andrew McGrath
Department of Earth Science
UC Santa Barbara

Litopterns, an extinct group of ungulates (hoofed mammals), helped comprise the largely endemic South American Cenozoic mammal fauna that arose due to the continent's isolation from other large land masses. They faced similar evolutionary challenges as other, more familiar ungulate groups, such as horses or antelope,throughout their history. Studying the ways in which these groups' solutions converged, such as loss of digits. or diverged can offer clues as to how natural selection affects morphology. The two most diverse and longest-lived litoptern subgroups, Macraucheniidae and Proterotheriidae, offer the most potential in this regard and are examined herein.

Four new litoptern species, two macraucheniids and two proterotheriids, from the middle Miocene of Quebrada Honda, Bolivia, fill in important temporal and geographic holes in our knowledge of litoptern evolution. These species help bridge the gap betwewen the apparent peaks in diversity these groups experienced in the early and late Miocene, suggesting that the middle Miocene may not have been the low point in these clades' diversity as previously conceived.

Understanding macraucheniid and proterotheriid phylogeny (evolutionary relationships) is imperative to understanding patterns in their diversity and morphological evolution, whereas fossil occurrence data alone offers a limited picture. Combining these data not only highlights where the gaps in our knowledge lie but offers predictions regarding where this hidden diversity may lie and what sort of morphologies to expect.