The rise and fall of the conulariids: morphospace occupation in extinct cnidarians

Supervised by: Dr Frankie Dunn

Conulariids are a charismatic group of fossil cnidarians (relatives of living corals and jellyfish) which appear in the fossil record during the Cambrian Explosion, more than half a billion years ago, persist until the early Triassic Period (~230 million years ago) and are identifiable by their skeletons which show intricate and distinctive ornamentation. Their long geological record means that they survived three of the 'Big Five' mass extinction events, including the largest known extinction event – at the end-Permian – often called 'The Great Dying'. Understanding how organisms radiate and go extinct is a major question in palaeobiology, but no one has yet investigated these patterns in an early-diverging animal group. The student would characterise morphological variation in conulariids using the extensive museum collection as well as the literature to address three research objectives: 1) how did the conulariids respond to major events in Earth history (end-Ordovician, end-Devonian and end-Permian mass extinction events); 2) was maximal morphological variation (morphological disparity) achieved early or late in the evolutionary history of the group and 3) to examine macroevolutionary phenomena like morphological convergence. The project would not only serve as standalone, but would feed into a larger ongoing project involving researchers at the University of Oxford and elsewhere looking to characterise the morphological disparity of animal tubicolous fossils though the geological record.