“Digital dolphins and the evolution of novel sensory adaptations”

Abstract provided by Dr. Racicot:  Abstract: The ability to navigate using sound (echolocate) is a key evolutionary adaptation that has arisen independently in multiple animal groups, notably in the toothed whales (odontocetes). Pinpointing when, and how, echolocation arose in this group is a crucial area of research that can tell us much about the evolution of fully aquatic sensory systems, and may hold vital clues that will help us understand and conserve these charismatic animals. This talk explores our current understanding of the anatomy and evolution of echolocation in odontocetes, in particular through the use of non-destructive imaging techniques such as computed tomography (‘CT’). I describe several new important fossil discoveries that are shedding fresh light on the evolutionary history of this group, and tantalizing evidence for the independent (parallel) evolution of echolocation in early odontocete groups. This latter finding suggests that echolocation may have independently arisen more than once in this group, and may thus confer a powerful selective advantage in secondarily (and fully) aquatic lifestyles.