The central role of nitrogen in the evolution and modern extinction of coral reefs

Modern day reef-building corals (Scleractinia) emerged during the Triassic and narrowly escaped extinction during the end-Permian. At that time, an era of global ocean eutrophication is suspected in the dramatic loss of corals and most other marine species. I argue that the ecology of the Anthropocene is the modern stage for the evolutionary play (or perhaps, curtain call) of marine symbioses. In this talk, I will discuss the current state of our understanding of the physiological effects of nutrient pollution on coral health and resilience in an era of global change, which transcends the “top-down” vs. “bottom-up” debate. With an emphasis on nitrogen, I will present historical and modern datasets which identify the temporal and spatial trends in human impacts, in addition to new eco-physiological studies revealing the complex interaction between invertebrate hosts and their symbionts under changing environmental conditions.