Talk Title: What do Years 2100 and -55,932,100 have in common? Lessons from the past & proxy validation

Abstract: Carbon release rates from anthropogenic sources have reached a record high of more than 10 Pg C/y in 2015. Due to uncertainties in climate system feedbacks, the impact of the rapid carbon release on future climate and ocean biogeochemistry is difficult to predict accurately. This presentation will provide a modern- and paleo-perspective on the magnitude and rate of anthropogenic CO2 emissions. I will discuss effects of ocean acidification on marine organisms, the long-term legacy of mankind's fossil fuel burning, and geologic analogues from past climate episodes that may guide future climate change assessment. I will show that the current anthropogenic carbon release rate is unprecedented during past 66 million years by at least an order of magnitude. I will also discuss potential lessons that may be learned from the Paleocene-Eocene Thermal Maximum (~56 Ma). If time permits, I will examine proxies for past seawater carbonate chemistry and their validation, focusing on boron isotopes and boron/calcium ratios in biogenic and synthetic carbonates.