SFB754/MG seminar talk, 25th January 2017
Prof. Derek Vance, ETH Zürich

Title: The oceanic biogeochemical cycle of zinc and its isotopes

Abstract:

The spatial and vertical distributions of macro- (e.g. phosphate, nitrate, silica) and metal micro-nutrients control sequestration of carbon by the ocean's biosphere. This talk will summarize recent progress combining data and ocean biogeochemical models to further our understanding of processes that clearly control oceanic zinc (Zn) distributions, and that are relevant to other metals as well. These new findings include: 1) the realisation that Zn distributions in the modern ocean are completely dominated by uptake into and regeneration from diatoms in the Southern Ocean; 2) the finding that this dominant biological process does not fractionate Zn isotopes and cannot explain the heavy Zn isotopic composition of the dissolved oceanic pool; 3) the conclusion that oceanic Zn isotopes are controlled by another key process - removal to sediment by sulphide.

More generally, though attention has often focused on the roles that the transition metals play in microbial cells, it seems increasingly clear that it is removal to sediment in anoxic and sulphidic bottom and pore waters that exerts the key control on their isotopes in the oceans, now and in Earth history.