

## **Rainer Kiko – Biological Oceanography (BI)**

### **Biological and physical influences on Marine Snowfall at the Atlantic Equator**

High primary productivity in the equatorial Atlantic Ocean is one of the key features of tropical ocean biogeochemistry and fuels a substantial flux of particulate matter towards the abyssal ocean. Since 2012 we use shipboard, moored and float-based high-resolution size-resolved particle imaging in combination with physical and biogeochemical measurement approaches to assess the impacts of physical forcing on primary productivity, food web dynamics and particle export across and along the Atlantic equator. We could show how seasonal upwelling and frontal dynamics, but also the positioning of the Equatorial Undercurrent in relation to the nitracline are related to upper ocean primary productivity and particle export. Advection of particulate matter from the South American coastal area towards the central Atlantic during a time of low upwelling activity in April/May 2022 seems to be an important aspect of equatorial particle dynamics as well. Contrary to earlier sediment trap observations, our work also indicates that particle flux does not decrease monotonously with depth (Martin-curve assumption), but increases at the daytime depth of Zooplankton Diel Vertical Migrations at mesopelagic depth, likely related to Zooplankton fecal pellet release and mortality. Our observations also enable us to better understand how epi- and mesopelagic dynamics lead to the modulation of the marine equatorial snowfall even at bathypelagic depth, along and across the equator and throughout the year.