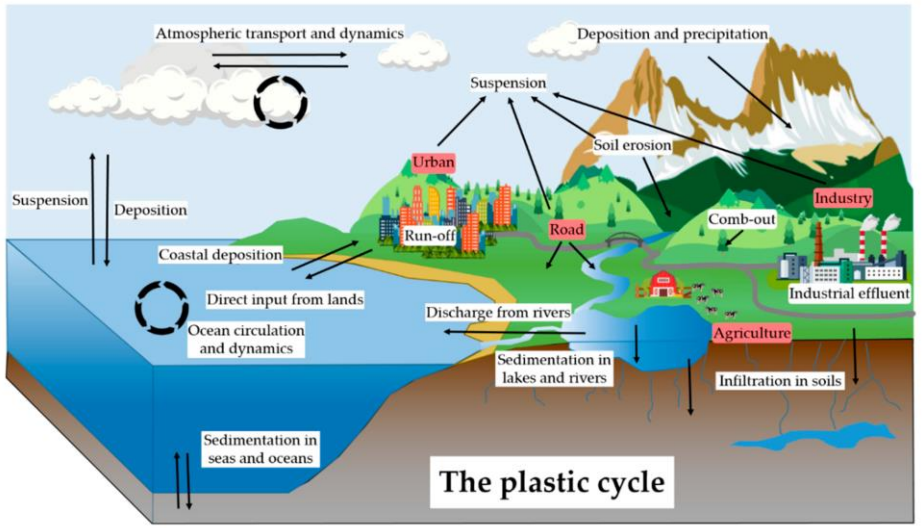
Atmospheric transport of micro and nanoplastics and fluorescence detection of particles < 20 µm

Bianco Angelica, Sordello F., Ehn M., Vione D., Passananti M.

UNIVERSITY OF HELSINKI
chimica
INAR INSTITUTE FOR ATMOSPHERIC AND EARTH SYSTEM RESEARCH

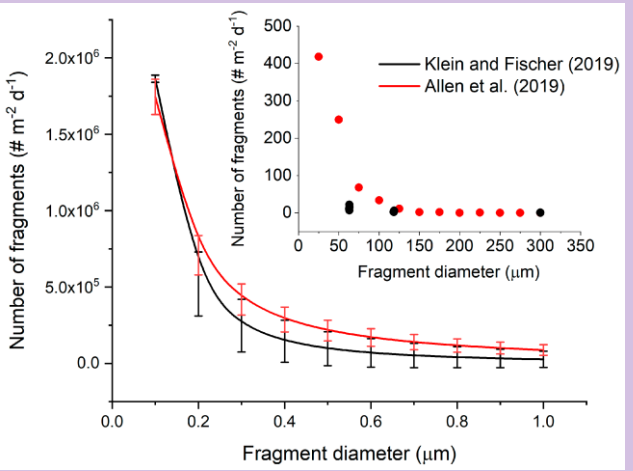


Conceptual model of the biogeochemical cycle of plastic. Red boxes represent sources and white boxes represent transport factors and mechanisms. Arrows represent transport pathways

More and more studies on microplastic dispersion and deposition in the atmosphere

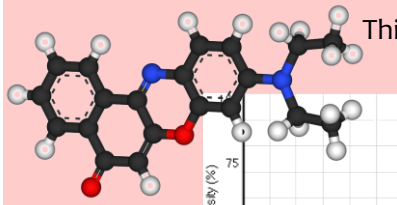
Little is known about microplastics and nanoplastics with sizes lower than 20 µm, which is the current limit for FT-IR and Raman microscopy

Logically, nanoplastic should be more concentrated in number than microplastics

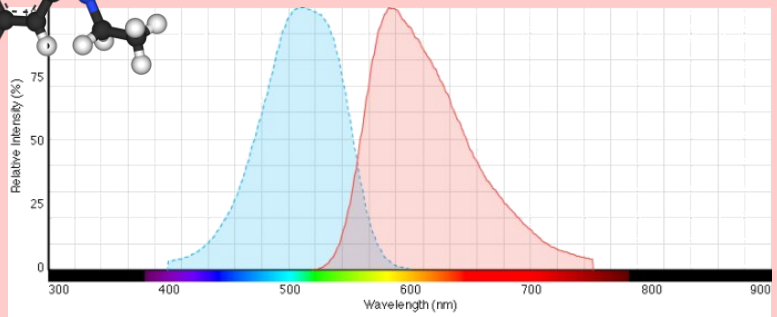


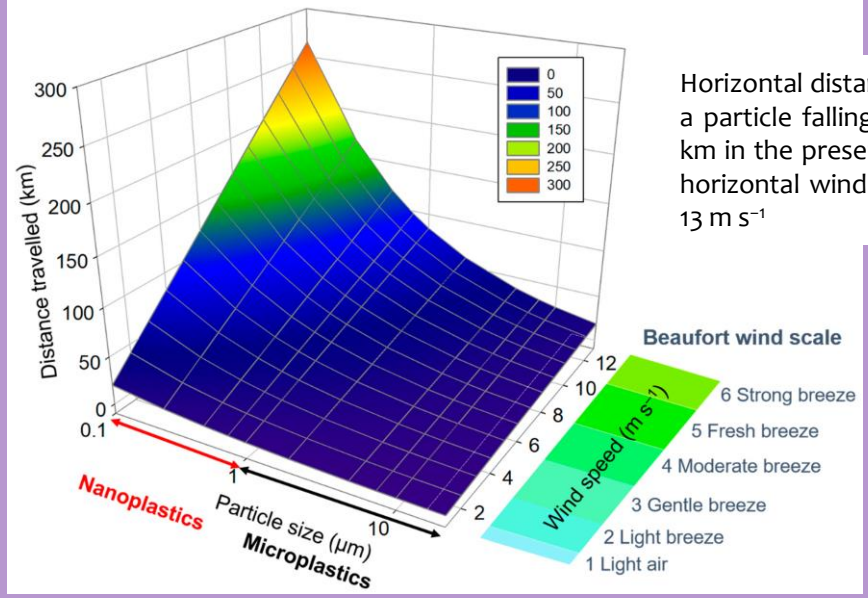
Theoretical deposition of nanoplastics as a function of particle size calculated using the extrapolation of the fit of experimental data presented on the insert. Insert: number of fragments reported in the study from Allen et al. (2019) and Klein and Fischer (2019)

WORK IN PROGRESS



This detection is based on staining microplastics with a fluorescent dye, Nile red, and detect the fluorescent signal by microscopy





Horizontal distance travelled by a particle falling vertically for 1 km in the presence of constant horizontal wind between 1 and 13 m s^{-1}

Bianco, Passananti, Atmospheric Micro and Nanoplastics: An Enormous Microscopic Problem, Sustainability, 2020