

# Optically resolving size and density distributions of particles in the dissolved-particulate continuum from 20 nm to 20 mm to improve the estimate of carbon flux

## SCIENCE GOAL

- How variations in particle size composition impact the estimate of carbon export

## OBJECTIVES

- Measure vertical distribution of volume scattering functions
- Estimate the size and density distributions of particles of sizes from 20 nm – 20 mm using VSF-inversion and imaging methods
- Estimate total and size-fractionated mass flux using PSD and density distributions
- Statistical analysis on how does VSF-based carbon estimate relate to the total flux out of the surface layer

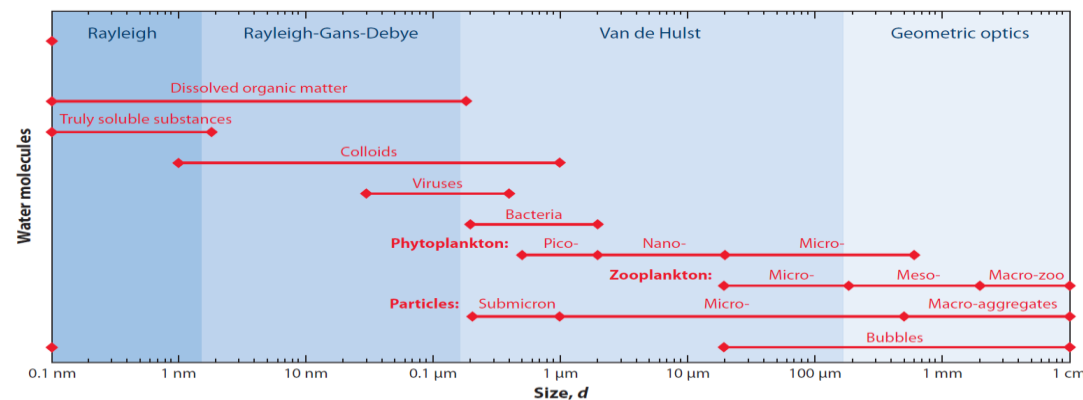
## TEAM MEMBERS

Xiaodong Zhang, PI: VSF-inversion

Deric Gray, Co-I: VSF measurements

Yannick Huot, Co-I: IFC

Lionel Guidi, Co-I: UVP



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## LOGISTICS

Survey Ship (4 berths)

Water samples from CTD  
(10 L per sample)

Frequency: min. 2/day,  
desired 3-4/day

Depths: min. 3 at surface,  
DCM, deep; desired 2  
additional depths above  
DCM/Pycnocline)

Process on-board

## LISST-100X

Spectral Volume Scattering Meter  
(VSF from 0.5 – 179 at 8  
wavelengths)

LISST-VSF (VSF from 0.1 – 150 at  
532 nm)

Manta ViewSizer (dynamic light  
scattering, PSD from 0.02 – 1 μm)

Imaging flow cytometer

