



## **Lagrangian Flow networks: a new way to characterize transport and connectivity in geophysical flows**

Enrico Ser-Giacomi, Emilio Hernandez-Garcia, Cristobal Lopez, Vincent Rossi, and Ruggero Vasile  
IFISC (CSIC-UIB), Spain

Water and air transport are among the basic processes shaping the climate of our planet.

Heat and salinity fluxes change sea water density, and thus drive the global thermohaline circulation. Atmospheric winds force the ocean motion, and also transport moisture, heat or chemicals, impacting the regional climate.

We describe transport among different regions of the ocean or the atmosphere by flow networks, giving a discrete and robust representation of the fluid advection dynamics.

We use network-theory tools to gain insights into transport problem. Local and global features of the networks are extracted from many numerical experiments to give a time averaged description of the system. Classical concepts like dispersion, mixing and connectivity are finally related to a set of network-like objects contributing to build a "dictionary" between network measures and physical quantities in geophysical flows.