# A Homotopy co-momentum Map in Hydrodynamics

**Antonio Michele Miti**

Universitá Cattolica del Sacro Cuore, Department of Mathematics and Physics, Brescia
 KU Leuven, Department of Mathematics, Leuven

`antoniomichele.miti@kuleuven.be`

Mauro Spera

Universitá Cattolica del Sacro Cuore, Department of Mathematics and Physics, Brescia

`mauro.spera@unicatt.it`

In this talk, based on joint work with M. Spera [1], we investigate some connections between multisymplectic geometry and hydrodynamics.

After a brief review of the basic definitions of *multisymplectic manifold* and *Lie-$\infty$ algebra of observables* [2], we recall the notion of an *Homotopy co-momentum map* [3] and realize an explicit construction of such object in the case of $\mathbb{R}^3$ which is relevant to hydrodynamics. In this way, we are able to reinterpret the so-called *Rasetti-Regge currents* [4], introduced in the contest of vortex dynamics, as momenta associated to the vorticity.

Time permitting, we shall discuss a generalization of the above construction in the case of *perfect fluid* on compact, oriented Riemannian manifold satisfying appropriate cohomological conditions.

The former construction finds an application in knot theory starting from the observation that $n$-links can be related to suitable *conserved quantities* [5].

# References

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