

# INSALATE DI MATEMATICA



## The hidden geometry behind stratified fluids model in 3D

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### IN THIS TALK

How are Geometry and Physics connected? The equations of motion of stratified fluids are a system of PDES but they can also be described through geometrical objects called Hamiltonian structures. More specifically, the sharply stratified fluids problem (two irrotational homogeneous fluid flowing together in a channel) can be seen from a geometric point of view as a quotient space. In this way, it can be given a very simple Hamiltonian structure through a process of Hamiltonian reductions. Using the Hamiltonian structure we can find various asymptotic models that approximate our problem and are easier to treat. In this talk, we give an overview of these techniques and apply them to stratified fluids equations in three dimensions.

 **words: Hamiltonian reductions, Stratified fluids, Asymptotic models**

*"Obvious" is the most dangerous word in mathematics.*  
(Eric Temple Bell)



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