

# SEMINAIRE DE MECA-FLU

ONERA – Centre de Châtillon  
29 avenue de la Division Leclerc – 92320 CHATILLON

Salle Contensou  
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## **Adaptive numerical methods for fluid mechanics**

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The equations of fluid mechanics can be used to describe natural processes over a wide range of scales, from the behaviour of micro-organisms to astrophysics. Each of these processes is in turn often controlled by internal interactions on widely different scales. Numerical methods able to efficiently resolve these interactions are — in combination with theoretical analysis and lab experiments — an essential tool for advancing our understanding. I will give a general overview of the hierarchical numerical methods I have worked on, as implemented within the free software Gerris Flow Solver (<http://gfs.sf.net>) and Basilisk (<http://basilisk.fr>) and discuss a range of applications including microscale high-energy droplet dynamics, multiphase and complex flows and tsunamis.