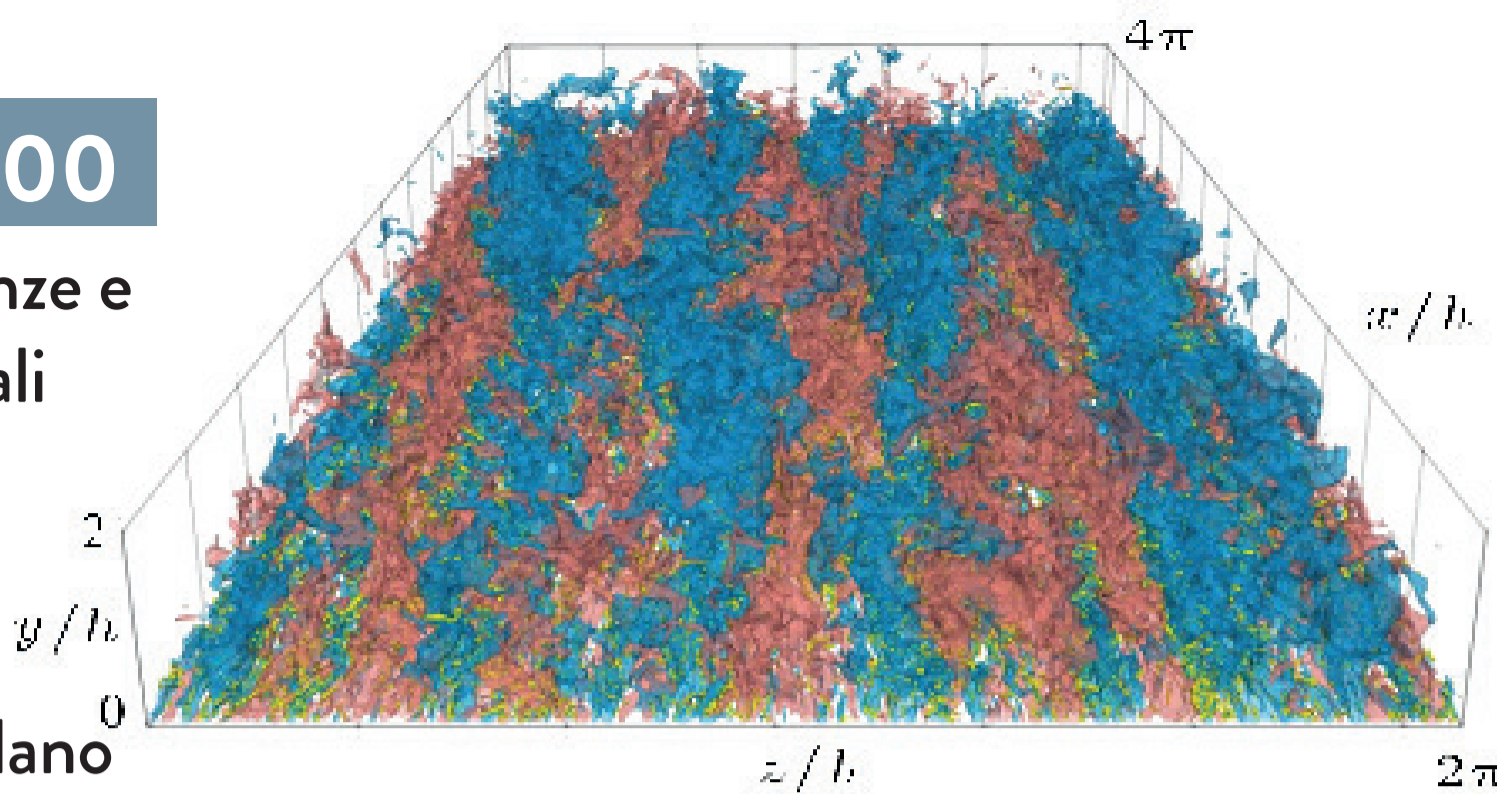


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Dipartimento di Scienze e
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DIPARTIMENTO DI
SCIENZE E TECNOLOGIE
AEROSPAZIALI

The role of very large-scale motions in wall turbulence

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Our ability to model and control turbulent flows relies on the present understanding of the interactions between the wealth of vortical structures with different characteristic length scales that coexist in wall-bounded turbulence. They range from the small-scale eddies populating the near-wall turbulence cycle to very large-scale structures, which are much larger than the near-wall vortices.

In particular, the interaction between these extreme scales has been intensively investigated in the last decades, for being a potential target of drag-reducing control and due to its impact on the anomalous Reynolds-number scaling of even the simplest turbulent statistics.

In the seminar, we will briefly review the present knowledge and introduce some new results regarding the interaction between the very large scale motions and small-scale near-wall turbulence. The phenomena of large-scale superposition and modulation of wall turbulence will be discussed and revisited. We will also comment on the role of turbulent large-scale structures in comparing the global energy budgets of different wall-bounded flows.