UNIVERSITÀ DEGLI STUDI
DI MODENA E REGGIO EMILIA

Il giorno 25 Novembre 2026, alle ore 14:00

Filippo Palma
Università degli Studi della Campania “Luigi Vanvitelli”

TERRÀ UN SEMINARIO DAL TITOLO

“On the existence and partial regularity of a weak solution to the Navier–Stokes equations in exterior domains with L^p initial data and applications to the Finn Starting Problem”

We investigate the existence and the partial regularity of a weak solution to the Navier–Stokes initial boundary value problem in an exterior domain for initial data that do not have finite kinetic energy. In particular, we consider initial data in the Lebesgue spaces L^p, $p \in (2, 3)$. Employing a suitable decomposition of the initial datum as the sum of a “small” L^3 contribution and of a “big” L^2 contribution, we obtain a global weak solution. The solution is constructed as the sum of a global regular solution to an auxiliary Navier–Stokes problem, related to the “small” L^3 contribution to the initial datum, and of a global weak solution to a perturbed Navier–Stokes problem, related to the “big” L^2 contribution to the initial datum. For our weak solution, we prove a partial regularity result in the spirit of Leray’s Théorème de Structure. Of course, our result holds also in the particular cases of the Cauchy problem and of the initial boundary value problem in a half-space.

As a natural continuation of the aforementioned study, we investigate the attainability of a steady state for a viscous, incompressible, Newtonian fluid moving past a translating rigid obstacle if the fluid is subject to an L^p initial perturbation.

References

[1] P. Maremonti, F. Palma, A new proof of the Théorème de Structure related to a weak solution to the Navier–Stokes equations, to appear in JMFM (arXiv:2512.05598).

[2] F. Palma, An L^p-theory for global weak solutions to the Navier–Stokes equations in exterior domains, arXiv:2607.21282 (2026).

[3] F. Palma, Navier–Stokes flow past a translating body: attainability of the steady state as limit of an L^p weak solution, arXiv:2610.28150 (2026).

Aula L1.3 – Via Campi 213/A (Fisica)
Durata: 35 min + 5 min di discussione

È gradita la partecipazione di docenti, ricercatori e studenti.

L’organizzatore
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