

## **Existence and regularity results for inhomogeneous Navier-Stokes equations with unbounded density**

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I will talk about my recent work in collaboration with Jean-Paul Adogbo (Université Paris Dauphine) and Piotr Mucha (University of Warsaw). Our main result concerns the global existence of a unique solution when the initial density is unbounded and belongs to a specific subset of the Yudovich class of unbounded functions. The core of our proof lies in the application of Desjardins' inequality, combined with a blow-up criterion for ordinary differential equations. Then, we adjust the time-weighted estimates obtained by Danchin and Mucha (2019) to derive the regularity providing the equivalence of Eulerian and Lagrangian formulations and in consequence conclude uniqueness.