

# Partial Differential Equations Seminar

**Title** Rigidity of Steady Solutions to the Navier–Stokes Equations in High Dimensions

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**Location** 과학관 225

## Abstract

Solutions with scaling-invariant bounds, such as self-similar solutions, play an important role in the understanding of the regularity and the asymptotic structure of solutions to the Navier–Stokes equations. In this talk, I will present our recent work where we proved any steady solutions satisfying  $|\nabla u(x)| \leq C/|x|$  in  $\mathbb{R}^n \setminus \{0\}$ ,  $n \geq 4$ , are trivial. Our main idea is to analyze the velocity field and the total head pressure via weighted energy estimates. Our proof is elementary and short. These results not only give the Liouville-type theorem for steady solutions in higher dimensions with neither smallness nor self-similarity assumptions but also help remove possible singularities of solutions. This is a joint work with Changfeng Gui, Hao Liu, Yun Wang, and Chunjing Xie.



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