

Eddies against the wall

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Fluids experts writing in the journal *Physics of Fluids*, which is published by the American Institute of Physics, are projecting it will be many decades before we can accurately probe the properties of turbulence near walls. High-Reynolds-number flows (which are prone to turbulence) are critically important in aeronautics, naval applications, energy conversion processes, manufacturing, mixing and dilution of pollutants, and in many aspects of climate modeling, according to Professor Hassan Nagib at the Illinois Institute of Technology in Chicago.

Recent advances in computing have allowed great strides to be made in modeling [fluids](#), significantly modifying the traditional fluids framework, but only for flows involving low Reynolds numbers. Future developments in high-Reynolds-number flows depend on improved measuring techniques and the construction of new facilities, say Nagib and his colleagues.

The paper reviews the salient advances that have introduced new elements into the theoretical foundations of fluids and challenged textbook orthodoxy.

"We also highlight aspects where differences of opinion persist," says Nagib, "which we hope might mark the beginning of their resolution." By outlining the gaps in our understanding that still exist, the authors hope, in principle, to provide a roadmap for future research on the topic.

More information: The article, "Wall-bounded turbulent flows at high Reynolds numbers: Recent advances and key issues" by I. Marusic, B. J.

McKeon, P. A. Monkewitz, H. M. Nagib, A. J. Smits, and K. R. Sreenivasan was published online in the journal *Physics of Fluids* on June 29, 2010. See: link.aip.org/link/PHFLE6/v22/i6/p065103/s1

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