

Reynolds Number: How high is high?

Alexander J. Smits
Department of Mechanical and Aerospace Engineering
Princeton University

To attain a very large range of Reynolds numbers in the laboratory, it is convenient to use high-pressure air. We have made extensive use of this approach to study the behavior of full-developed pipe flow, turbulent boundary layers, and the wakes downstream of bodies-of-revolution. Based on this work, as well as recent DNS, I discuss some of the questions that persist for the scaling of pipe and boundary layer flows at high Reynolds number, including the scaling of the mean velocity profile, streamwise turbulence intensity, spectra, coherent motions and superstructures.