The 2008 DCAMM Annual Seminar Speaker

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Tuesday, December 16th, at 11:00-12:00
in auditorium 72, Building 421, DTU - Vagn Aa. Jeppesens Vej, 2800 Kgs. Lyngby

Friday, December 12th, at 13:00
in auditorium 1.208,Fibigerstræde 16, Aalborg Universitet, 9220 Aalborg

The lecture aims at popularizing mechanical science to a broad audience of interested DTU students and staff, and engineers from outside.

Is there an asymptotic effect of initial and upstream conditions on turbulence?

Abstract:
More than two decades ago the first strong experimental results appeared suggesting that turbulent flows might not be asymptotically independent of their initial (or upstream) conditions. And shortly thereafter the first theoretical explanations were offered as to why we came to believe something about turbulence that might not be true. It was recognized immediately that if turbulence was indeed asymptotically dependent on its initial conditions, it meant that there could be no universal single point model for turbulence, certainly consistent with experience, but not easy to accept for the turbulence community. Even now the ideas of asymptotic independence still dominate most texts and teaching of turbulence. This lecture will review the substantial additional experimental, numerical and theoretical evidence for the asymptotic effect of initial and upstream conditions that has accumulated over the past 20 years. Emphasis will be placed on the canonical turbulent flows (especially wakes, jets, and homogeneous decaying turbulence), which have been the traditional building blocks for our understanding. Some of the implications for the future of turbulence modeling and research, especially LES and turbulence control, are also considered.

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