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To most people, turbulence is the inconvenient and occasionally frightening phenomenon that they sometimes experience when traveling by air. While, to many engineers, scientists and technologists, it is the most pervasive form of fluid flow, and enhances processes like mixing, and heat and mass transfer. At the same time, for these benefits you pay the price of increased resistance to flow. In my early days at Edinburgh, when working on friction reduction by polymer additives, I was told by an engineer from the Hydro-Electric Board that turbulent friction cost them a million pounds a day. That would be ten million pounds per day in today's money. So, well worth looking into some friction reducing additives! Then, to a somewhat smaller number of people, turbulence is the unsolved problem of classical physics. That is the subject of this website and blog.

It is usual to think in terms of turbulent flow in pipes or perhaps in free jets and wakes. However, we will be concerned with *isotropic* turbulence, which might be thought of as being *physicist's turbulence.* Certainly I have referred to it as such over the years, in the context of both undergraduate and postgraduate student projects. This was introduced by Taylor in the 1930s, along with the idea of using a Fourier representation of the velocity field in *wavenumber* space. The resemblance of this to the subject of *statistical mechanics* was pointed out by Batchelor in his classic monograph, and this has influenced the development of statistical theories ever since, with the Fourier components of the velocity field playing the traditional role of the degrees of freedom of a statistical system.

As the subject developed in the 1950s/60s, it became clear that problems like turbulence did not fit into statistical mechanics which was increasingly seen as a canon of solved problems in which the degrees of freedom are at most weakly coupled. Instead turbulence was seen as an example of the many-body problem, in which individual degrees of freedom are strongly coupled (or *interacting*). Indeed, it was recognised that the mathematical structure of the Navier-Stokes equations in wavenumber space very much resembled that of quantum field theory, and this turned out to offer a fertile line of attack on the basic turbulence problem which is one of obtaining a closed set of equations for mean quantities.

Although there have been individual successes, in general the many-body problem has proved obdurate, and in many branches of physics there is a tendency to find other ways of studying the subject. However, the turbulence problem is different from most others for two important reasons. First, there can be no question of evading the basic problem of how to calculate the statistical properties of a turbulent flow: this is an urgent matter in many different practical applications. Secondly, unlike in physics where there is an educational continuum between the experimenters and the theorists, in turbulence the applied scientists and engineers almost literally talk a different language to the theoretical physicists who work in this field. That is where the present blog hopes to make a contribution.

Further information about the purpose of the blog will be found under the ABOUT tab, while lists of my books and recent articles will be found under PUBLICATIONS.