

Introduction to Turbulent flows and their prediction : A tribute to Prof Tulaji

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Turbulence is pervasive in both nature and technology. Navier-Stokes equations fully describe the dynamics of the flowing fluid in all its manifestations including turbulence. Although Mathematicians look forward to proving the existence and global smoothness of the Navier-Stokes equations (which is still an unclaimed Clay foundation problem), engineers have always looked for practical and approximate ways of solving the problem. Given the fine enough resolution, Navier-Stokes fully resolves the entire spectrum of scales. However, it is not the preferred choice owing to cost considerations. This talk will present the perspective of engineers and how they approach the problem of fluid turbulence through the Reynolds averaging route and how they construct relevant closure strategies for the prediction of turbulence.

This talk is dedicated to the memory of Prof Tulaji, who taught a popular course with the above title "Introduction to Turbulent flows and their prediction" for decades. This has benefited several generations of students.