

Walter Rusin, "*Honey, Water, Air. What's the difference?*"

In fluid mechanics we consider fluids that are viscous and fluids that are inviscid. Equations modelling these cases (Navier-Stokes and Euler equations respectively) differ not only by the term $\nu\Delta u$ but have also different boundary conditions. We can now ask a natural question: Is there a chance that if we take the limit $\nu \rightarrow 0$ solutions of the Navier-Stokes equations will converge to solutions of Euler equations? And even further: which solutions? Converge in what sense? What about the boundary conditions? etc.

In my talk I'll try to give you a grasp of difficulties arising in considering that kind of problems, show what tools are widely used in this field of mathematics and give some positive answers to above questions.