Recent advances in boundary layer at vanishing viscosity limit.
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This contribution is based on the Kato theorem and on some work which I started with Edriss Titi and continued with Wiedemann and Szekelyhidi.

To the best of my knowledge the Kato theorem provides the simplest relation between the anomalous energy dissipation and the appearance of turbulence.

For such anomalous energy dissipation both if and only if conditions and sufficient conditions have been provided. But what is striking and this what I want to emphasize is that these conditions are in full agreement with observations coming from engineering science or fluid mechanic literature.