The Ultimate Discrete Scheme (UDS)

A hypothetical "Ultimate Discrete Scheme" must possesses the following three properties

- **Robustness** The scheme must be *robust*: capture shocks, maintain positivity, preserve monotonicity, satisfy involutions (divergence constraints), properly preserve energy partition.
- **Accuracy** Provide low dissipation for smooth high-k modes to properly simulate turbulence. Converge quickly to give accurate results when needed
- **Efficiency** Run rapidly for modest resolutions. Do interesting physics on a laptop. Use GPUs and other hardware accelerators for larger simulations. Do 1000s of simulations.

Sadly, such a scheme does not exist! Many of the goals are contradictory.

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"All numerical methods suck, though some suck less than others. Make sure your method sucks less that the competition"