

Abstract Submitted
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The definition of turbulence and the direction of the turbulence energy cascade CARL GIBSON, Univ. of Cal. at San Diego — Turbulence is defined as an eddy-like state of fluid motion where the inertial-vortex forces of the eddies are larger than any other forces that tend to damp the eddies out. Because vorticity is produced at the Kolmogorov scale, turbulent kinetic energy always cascades from small scales to large. Irrotational flows that supply kinetic energy to turbulence from large scale motions are by definition non-turbulent. The Taylor-Reynolds-Lumley cascade of kinetic energy from large scales to small is therefore a non-turbulent cascade. The Reynolds turbulence poem must be revised to avoid further confusion. Little whorls on vortex sheets, merge and pair with more of, whorls that grow by vortex forces, Slava Kolmogorov! Turbulent mixing and transport processes in natural fluids depend on fossil turbulence and fossil turbulence waves, which are impossible by the TRL cascade direction. Standard models of cosmology, astronomy, oceanography, and atmospheric transport of heat, mass, momentum and chemical species must be revised. See journalofcosmology.com Volumes 21 and 22 for oceanographic and astro-biological examples.

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