

Popular science summary of the PhD thesis

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Title of the PhD thesis	Dynamic Insights into Non-Local Energy Transfer in Non-Stationary Turbulence: Theory, Energy Transfer Mechanisms, Methodology and Experiments
PhD school/Department	Department of Civil and Mechanical Engineering

Science summary

Unraveling Turbulence: A Journey into the Chaotic Beauty of Fluid Dynamics

Turbulence, that seemingly chaotic dance of fluid motion, has long captivated the minds of scientists and artists alike. From the graceful swirls of a river to the tumultuous storms of Jupiter, turbulence is ubiquitous in nature. Yet, understanding its intricacies has remained a formidable challenge, akin to deciphering a symphony played by the winds.

In the realm of fluid dynamics, the Richardson-Kolmogorov energy cascade stands as a fundamental concept, akin to the heartbeat of turbulent flows. In recent years, this concept has come under heightened scrutiny, leading to a deeper exploration of the scale-locality phenomenon. Imagine turbulence as a cascade of energy, flowing from large scales down to the smallest eddies, each interacting in a complex web of motion.

In our quest to unravel the mysteries of turbulence, we delve into the realm of non-stationary flows, where the very fabric of fluid motion is in constant flux. Here, traditional methods falter, but innovation thrives. Our journey begins with the realization that in these dynamic flows, the classic energy budget equations fall short. We introduce novel ideas about a theory, data analysis method and experiments to unlock the secrets hidden within the chaotic dance of fluid motion.

In the end, our quest for knowledge transcends the boundaries of academia, reaching out to touch the lives of all who marvel at the beauty of the natural world. For in the turbulent currents of life, we find not only chaos but also beauty, a reminder of the profound interconnectedness of all things. And so, as we peer into the depths of turbulence, let us not forget the wonder that lies within, waiting to be discovered.

Please email the summary to the PhD secretary at the department