



Sixth Madrid Turbulence Workshop



June 2 – July 4, 2025

Universidad Politécnica de Madrid

The goal of the **CAUST** ERC project is to understand whether the ever-increasing power of computers can be leveraged into untangling the causal dynamics of turbulence. Such as by the use of massive ensembles of simulations followed by analysis of the resulting data. All tools are welcome, from classical hypothesis-driven data processing to the grey-box tools of ‘artificial intelligence’. The final goal, in any case, should be physics.

Problems of interest: It has been about 50 years since the first papers on deterministic chaos, and on coherent structures in turbulence:

- Are the two related? If so, how?
- How do multiple structures interact?
- Are they relevant to turbulence physics?
- What happens to incoherent turbulence?
- Is any of this related to cause and effect?
- Is it useful? How about control? ROMs?

Resources:

- In house parallel and GPU-based servers, postprocessing and mass storage facilities.
- Access to existing simulation data bases (e.g. channels, homogeneous shear, boundary layers and isotropic turbulence at moderately or ‘high’ Reynolds numbers, including statistically significant time-resolved sequences in all cases)

Expressions of interest: A **brief proposal** (two pages at most), including the problem to be addressed, a preliminary work program, resources to be used, and financial requirements, should be submitted to the address below **BEFORE February 10, 2025**. Senior researchers are encouraged to include the participation of junior colleagues or students. A decision, partly based on available space and resources, will be communicated before the end of March.

Prof. Javier Jiménez: javier.jimenezs@upm.es
Please copy Aurora García: aurora.garcia@upm.es