



## Transition to hypersonic turbulence

*Dr. José I. Cardesa*  
*ONERA. Toulouse, France*

The hypersonic flow regime introduces additional aspects of flow physics that can safely be ignored in subsonic/supersonic flows. In this talk, we will touch upon some of those hypersonic features that extend the (already long) list of mechanisms that make turbulence a challenging research topic. After explaining real gas effects at a basic level, their impact on wall bounded turbulence will be reviewed based on a bird's eye view of recent literature. The aim here will be to highlight the new questions that arise as a result of the turbulence being studied under hypersonic flow conditions. In the second part of the talk, an opposite trend will be shown: how turbulence makes hypersonic flows more complex to study than their lower Mach number (yet still turbulent) counterparts. This arguably contorted reasoning should become clear when discussing the difficulties encountered upon studying the impact of ambient turbulence on hypersonic flow transition

**Day:** **8 June, Thursday**

**Time:** *11:00 h.*

**Place:** *E.T.S. Ingenieros Aeronáuticos*

*Aula Magna, Building C. Ground floor*

**Remote:** <https://upm.zoom.us/j/87425812366>