Eidgenössische Technische Hochschule Zürich
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Institute of Energy Technology: Prof. R.S. Abhari (LEC), Prof. K. Boulouchos (LAV)
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Institute of Mechanical Systems: Prof. G. Haller (NDS)
Institute of Fluid Dynamics: Prof. P. Jenny, Prof. T. Rösgen (IFD)

21/12/2018

I N V I T A T I O N

to a talk as part of the

Colloquium Thermo- and Fluid Dynamics

Date: **Wednesday, January 30, 2019**

Time: **16:15h**

Place: Machine Laboratory ETH Zurich, **Lecture Hall ML H 44**

Speaker: **Prof. Luca Biancofiore**
Department of Mechanical Engineering
Bilkent University, Ankara, Turkey

Title: **The kernel wave perspective: from geophysics to engineering**

Within the geophysical sciences, shear instability is known to be an important cause of turbulence and mixing in the atmosphere and oceans. A linear stability analysis is often used to determine whether small perturbations applied to the flow will grow in time. However, the results of stability analyses can often be nonintuitive, and one would hope that a consistent physical interpretation of instability can help to explain these results. One such physical interpretation, i.e. the kernel wave perspective, is based on the idea that two otherwise stable waves that exist in the flow may interact to produce instability. In this seminar, this physical interpretation is taken beyond its natural habitat, i.e. from geophysical sciences, and exploited for industrial purposes. In particular, it is used to improve the design of the injectors of rocket engines where the combustion efficiency is strictly connected with the quality of the mixing between gaseous H_2 and liquid O_2. The kernel wave perspective helps us to explain (i) why adding a recess to these injectors significantly improves the mixing and (ii) the counterintuitive destabilizing effect of the surface tension at the interface between these two fluids.

Host: Prof. P. Jenny

Guests are welcome!