## Talk 5: Valérie Chavez Demoulin (Université de Lausanne)

## Title: Extremal Causality: A Model-Agnostic Framework with an Application to Climate Risk Analysis

Abstract. This talk addresses climate-related risk by introducing a novel, model-agnostic method to detect causal relationships between variables under extreme conditions. Using multivariate generalized Pareto distributions and Wasserstein distances, I will define "extremal causality" based on asymmetries in tail dependence. Applied to hydrological data from Switzerland, the method uncovers how extreme climate events influence key environmental variables. It identifies directional causal links both in simulations and in real-world data, offering a valuable tool for understanding and managing the impacts of climate extremes. This is a joint work with Linda Mhalla and Philippe Naveau.