

Defense of PhD thesis entitled

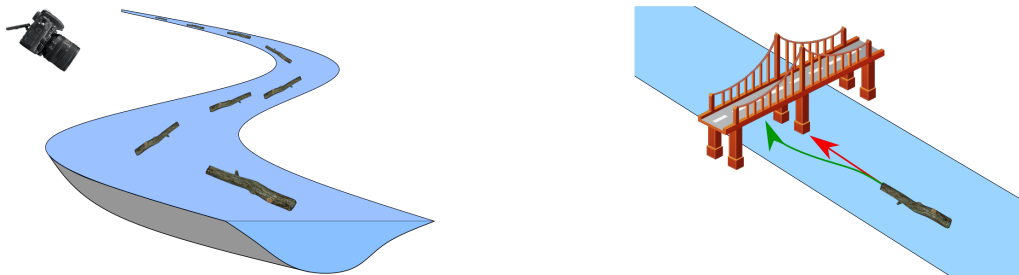
# Study of driftwood dynamics in rivers for hazard assessment

by:  
Hossein GHAFFARIAN ROOHPARVAR  
INSA Lyon, Laboratories LMFA and EVS

**Date and place:**  
Friday 15 Nov 2019 at 9h30  
in amphitheater "Ouest" batiment des Humanités [INSA Lyon]

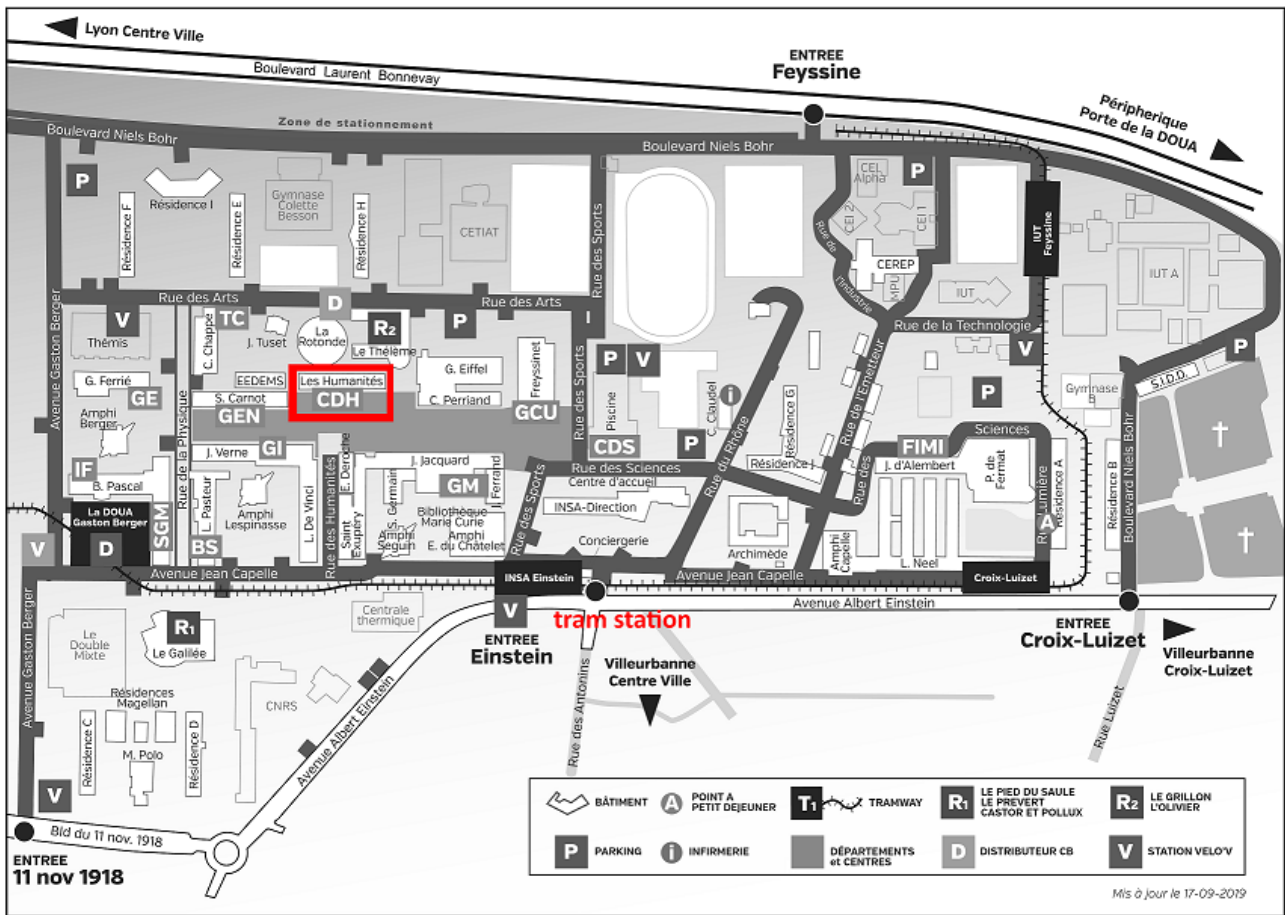
**Jury members:**

Mario Aristide LENZI, Professor at Univ. degli Studi di Padova (Reviewer).  
Dieter RICKENMANN, Research director at Swiss Fed. Res. Inst. WSL (Reviewer).  
Laurence BERGOUGNOUX, Maitre de conférences at Univ. Aix Marseille (Examiner).  
Laurence DUCHESNE, Engineer at CNR (Examiner).  
Jean-Philippe MATAS, Professor at Univ. Claude Bernard Lyon 1 (Examiner).  
Nicolas RIVIERE, Professor at INSA Lyon (Supervisor).  
Diego LOPEZ, Maitre de conférences at INSA Lyon (Co.Supervisor).  
Hervé PIEGAY, Research director at CNRS (Co.Supervisor).



**Abstract:**

Driftwood is an integral part of river corridors where it plays an important role both in river ecology and morphology. During the last decades, the amount of large wood transported in some of the European rivers has increased, notably due to modifications in the human pressure and management of riparian forest buffers along rivers. This causes an increase of potential hazards for hydraulic structures and urban areas. In this context, the aim of this thesis is to study the driftwood dynamics in rivers in order to provide elements for hazard assessment. This is carried out in two ways: (i) using in-situ streamside videography to measure the amount of wood transported by the river during floods and (ii) analyzing the dynamics of individual pieces of wood both on the field and in a well-controlled experimental environment combined with theoretical models. The present work provides several scientific and technical contributions. First by studying the link between wood discharge and flood characteristics, such as flood magnitude, hydrograph and inter-flood time, we consolidate and extend the present knowledge about the link between flow and wood discharges. Second, our studies show that when a piece of wood is recruited into the river, it is accelerated on a limited distance, which scales as the wood length in the flow direction. Once the wood piece reaches the flow velocity, it behaves as a flow tracer. In terms of technical contributions, by comparing the video monitoring technique in two different sites, we provide some recommendations that are useful for practitioners for installing new monitoring stations. This work will be part of the driftwood hazard and risk assessments, for which accurate wood dynamics quantities are required.



Address:

1 Rue des Humanités, 69100 Villeurbanne, INSA Lyon Humanités building, amphitheater "Ouest".