

**Séminaire**



**Mardi 9 mai 2023 à 10h30**  
**Amphithéâtre Henri Benoît**

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# **Throwing Objects with the Superpropulsion Effect**

Among primates, humans are the only ones who can throw objects with speed and precision. For prehistoric hunter-gatherers, this skill was essential to their survival. Today, throwing is not as crucial as it once was, but it remains the focal point of many sports.

This seminar will address energy transfer in throws performed either by humans, mechanical actuators or analog systems. Launching an object with efficiency, i.e. with a maximum of kinetic energy, often requires an instrument (club in golf, racket in tennis, chistera in pelota, bow in archery ...). Here we will explore other solutions through smart objects that can be designed to extract the maximum available energy from a given launcher. The idea is to take advantage of a specific resonance effect that can be triggered by the use of soft elastic objects, composite materials, capillary effects or mechanical instabilities.

Experimental and numerical approaches will be presented. They show that the kinetic energy of a soft object can be multiplied by four compared to that of rigid objects launched under the same conditions. Applications in the fields of sports and biology will be discussed.

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*Les personnes souhaitant rencontrer C. Raufaste sont priées de prendre contact avec Wiebke Drenckhan.*