

## Séminaire

**Jeudi 23 octobre 2025 à 14h00**  
**Amphithéâtre Henri Benoît**

**Sophie Barrau**

UMET, Université de Lille

# Polymers and composite materials: relationships between structure and piezoelectric or thermoelectric properties

Harvesting ambient energy such as mechanical energy (vibrations) or thermal energy is a promising way to generate electricity, from the piezoelectric or thermoelectric effect respectively, to power autonomous portable devices. For these energy conversions, the use of flexible and lightweight materials such as polymers and composites appear to be a relevant alternative to their inorganic counterpart (rigid, heavy and sometimes toxic). However, the increase of the piezoelectric or thermoelectric properties implies the optimization of the polymer materials structure and morphology. In this talk, I will present the structure of well-known piezoelectric polymers (PVDF) and copolymers (PVDF-co-TrFE) characterized by wide angle and small angle X-ray scattering (WAXS/SAXS) and their evolution in-situ in temperature or under stretching, in order to establish the relationships with the piezoelectric properties. Conducting materials such as carbon nanotubes will then be incorporated to the polymer matrix in order to improve the piezoelectric properties or to confer thermoelectric properties to the materials depending on the conducting filler content.

Les personnes souhaitant rencontrer Sophie Barrau sont priées de prendre contact Laure Biniek.