Contribution ID: **77** Type: **Speaker**

Whispers in the WAVEs: Decoding Campus Vibrations with Distributed Acoustic Sensing

Friday 10 October 2025 11:15 (15 minutes)

The WAVE initiative at Hamburg's Science City Bahrenfeld brings together physicists, geophysicists, and engineers from the University of Hamburg, Helmut-Schmidt University, DESY and EuXFEL.
We have developed a dense seismic sensor network by using fiber-optic sensing technology to tap into telecommunication fiber. With this, we record both anthropogenic and natural vibrations and study their coupling into large-scale, high-precision research infrastructures limited by such disturbances.

Our applications range from fundamental physics, including gravitational wave detection, to monitoring changes in the urban subsurface driven by hydrological and thermal dynamics.

I will highlight how WAVE connects to materials. First, how we can help improve the precision of EuXFEL by monitoring vibrations and deformations in accelerator structures. And second, how we can advance Structural Health Monitoring (SHM) by embedding fiber-optic sensors in building materials and structures to detect subtle changes indicating damage or material fatigue.

Author: HADZIIOANNOU, Celine (University of Hamburg)

Presenter: HADZIIOANNOU, Celine (University of Hamburg)

Session Classification: MIN Materials

Track Classification: MIN Materials of the Future